THE BIOLOGIST

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LAMARCK AND LAMARCKISM—A MEMORIAL

By Ermine C. Case*

This year marks the second centenary of a man born in respectable obscurity, who toiled through life under a burden of poverty, whose toil continued through years of blindness, and whose greatest achievement was unrecognized for fifty years. His body was laid unmarked in common ground, a burial so temporary that in five years the bones were gathered, with those of others unknown, and cast into an ossuary in the catacombs of Paris. With those others unknown, his monument is the grandeur of that city.

As Lull wrote in his *Organic Evolution:*

> Lamarck (1744-1829) was one of the most remarkable as well as one of the most pathetic figures in evolutionary history. A man of brilliant attainments, yet because of ideas which failed to meet the approval of the influential Cuvier, and because of his own blindness and poverty, he suffered social ostracism for what he thought to be the truth and only received a tardy appreciation years after his death.

Packard, in his life of Lamarck, wrote in the opening sentence:

> The life of Lamarck is the old, old story of a man of genius who lived far in advannce of his age, and who died comparatively unappreciated and neglected.

Here one can only give the briefest outline of his life and mention but a small fraction of his scientific accomplishments. A full account can be found in any of the many biographies that have been written. Such facts as are mentioned are taken from Professor Alpheus Packard's life of Lamarck published in 1901. The details of his career were assembled with difficulty, for, as Packard tells us:

> Lamarck left behind him no letters or manuscripts; nothing could be ascertained regarding the dates of his marriages, the names of his wives or of all his children.

Jean Bapiste Pierre Antoine de Monet, Chevalier de Lamarck, was born August 1, 1744, in a small hamlet in Picardy, now the Department of the Somme, some twenty miles northeast of Amiens. The youngest of eleven children, he passed there the days of his infancy and childhood. His ancestry has been traced back some three hundred years from his birth, with more or less certainty, through a succession of the lesser nobility and military officers. How he, the youngest son, retained the title of De Lamarck is a matter of conjecture, but so he signed himself for years.

Some time before 1760, he reluctantly entered a Jesuit college, but on the death of his father in that year he withdrew and joined the French army as a volunteer. He so distinguished himself at the Battle of Fissinghausen as to win officer's rank on the field of battle. Shortly afterward an accident in garrison affected his health and he was compelled to resign from military service. He received a minimal pension of four hundred francs, and with that and other resources, of which we know nothing, he went to Paris and undertook the study of medicine. His resources were meager for he spent much of his time as a clerk in a bank. During these years he became acquainted with J. J. Rousseau and accompanied him upon collecting trips for botanical material. It has been noted that in Rousseau's writings there are references to the meaning of species and discussions of the relation of the individual organism to its environment. It is possible that from conversations on these trips came the ideas which culminated in his theory of evolution.

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*Ermine C. Case, who is Professor Emeritus of Historical Geology and Paleontology, at the University of Michigan, here gives what will be for most readers a new view of a great French philosopher and scientist whose theories refuse to lie buried. Professor Case, who was graduated from the University of Kansas in 1893, received his Ph.D. from Chicago in 1895 and became a member of the Department of Geology and Paleontology of the University in 1906. This article is reprinted through the courtesy of "The Michigan Alumnus Quarterly Review."

Lamarck soon abandoned his efforts to complete a course in medicine and devoted his attention to pure science. His studies centered upon botany, and for ten years he engaged in preparation for his first great publication, the *Flora of France*. This appeared in three octavo volumes in 1778 and won him immediate recognition and election to the Academy of Science. We know not how the expense of the publication was borne, but we do know that much of the cost of the preparation of manuscript and illustrations came from his slender purse.

In the Academy he had become acquainted with Buffon, who had helped him, in the guise of tutor to Buffon's son, to make a journey through Europe in 1781-82, visiting the museums and making collections of all sorts of material for the museum of the Academy. For this trip he received the title of Royal Botanist but neither salary nor compensation for expenses incurred. The material collected formed the basis of the collections in the Jardin des Plantes, and his studies of the museums enabled him to draw the plans upon which the Museum of Natural History was later organized.

Lamarck was Keeper of the Herbarium in the Jardin des Plantes at a meager salary, but was discharged upon a plea of economy. Later, in 1793, the Museum of Natural History was founded, and Lamarck, who had been a botanist for twenty-five years, was given the post of Professor of Invertebrate Animals. In the Museum he had found his proper place. His enthusiasm and his idiosyncrasies made him an apt illustration of a remark found in a recent book by Dr. Thomas Barbour of the Museum of Comparative Zoology at Harvard: "It is not necessary to be crazy to be a good museum man but it helps a lot." Packard says of this change of occupation:

> His life was also notable for the fact that after his fiftieth year he took up and mastered a new science; and at a period when many students of literature and science cease to be productive and rest from their labors, he accomplished the best work of his life—work which has given him lasting fame as a systematist and as a philosophic biologist.

It was the time of the beginning of the Reign of Terror in France, but Lamarck and his colleagues seem to have continued their work with a singular detachment, almost within sound of the busy guillotine. All were not so fortunate; Lavoisier, the Father of Chemistry, was beheaded, and the Abbé Haüy, founder of the science of crystallography, was saved with difficulty. Lamarck was now one of a group whose names are written large in the history of biological science—Saint-Hilaire, Buffon, Lacépède, Cuvier, and others. The Museum was receiving large collections from the French exploring expeditions of the early nineteenth century and one might think that all was going well with him financially, but on taking up his new position at fifty years of age he was already married for the second time, had six children with another arrow for his quiver on the road. He was married twice more, but had no other children.

The ever-present demand for a competence seems not to have hindered his scientific productivity, for in 1792 he founded, with others, the *Journal of Natural History* in which he published nineteen articles on botany, two on shells, and one on some subject in physics. In 1789 he published memoirs on fire and on sound, and in 1801 his last article on a botanical subject. It is impossible to list his numerous publications on meteorology, physical science, physiology, and paleontology.

In 1801 appeared the first of the seven volumes containing his *Natural History of Invertebrate Animals*, just eight years after he took up the new branch of science. The introduction included the first statement of his theory of evolution in two laws, which were afterward increased to four as published in his *Philosophie zoologique* in 1809. During all this time he was occupied in executive and minor duties at the Museum, such as preparing teaching collections, details of the purchase and exchange of material, and management of the menagerie.

After his sixty-fifth year his eyesight failed; in 1820 he referred to its complete loss. The last two volumes of his *Natural History of Invertebrate Animals* were dictated in complete blindness.

There are no details of his final sickness. Seemingly he sank under the ills of age and poverty and on December 29, 1829, passed from his life. He was buried in common ground in Montparnasse Cemetery with eulogies by Latreille and Saint-Hilaire but with no monument or even a simple marker.

That was the life of Lamarck, told in meager and bald outlines; it is past history. But he left an idea that is still part of current biological thought, an idea so potent that it goes today by his name—Lamarckism. This idea has been examined and re-examined in all its phases, and its voluminous literature is available. Here I present the story of this idea in a way that may seem a bit whimsical but which will not go beyond the truth. In his *Philosophie zoologique*, Lamarck presented four laws which governed the process of evolution as he understood it. Two of these contain the gist of his theory which has been in controversy ever since Darwin's *Origin of Species*, published fifty years later, forced the acceptance of the fact of evolution upon the scientific world. These two laws are:

> The production of a new organ in animal results from the supervention of a new want which continues to make itself felt, and of a new movement which this want gives rise to and maintains.

This is the statement of Lamarck's idea of a "sentiment intérieur," an inner feeling, which initiated the variation which is the origin of a species and which has been repeatedly reprobated and disproven.

The second law which concerns us is:

> Everything which has been acquired, impressed upon, or changed in the organization of individuals, during the course of their life, is preserved by generation and transmitted to the new individuals which have descended from those which have undergone those changes.

This is the somewhat redundant statement of his belief that a character acquired during the life of an individual is inherited by the offspring. It must be clearly understood that Lamarck did not believe that the environment of an organism caused a change, but that any change in the environment produced a want, need (*besoin* is his word), which led to the heritable change. It was Buffon who stated the belief that the environment impressed itself upon the individual, and spoke of the "hammer of the environment."

Lamarck's idea of the inheritance of acquired characters has been reprobated and repeatedly disproven, as was his idea of an inner feeling leading to change. It is this apparent necessity to reprobate and disprove, once and again, to which I wish to call attention. I am not here an advocate of either side of the controversy, I am simply an historian trying to throw light on a peculiar phase of the controversy.

To make my point more evident, I quote an old and well-known verse:

Truth crushed to earth shall rise again:
  Th' eternal years of God are hers;
But error, wounded, writhes in pain,
  And dies among his worshipers.

Lamarckism is an error that after repeated crushing refuses to die but continues to writhe into notice under a multitude of blows. This treatment of the subject may seem a bit whimsical, as I have said, but I must cry the reader's patience, for it is history, current history, up to the present day.

Clearly to understand the situation we must sketch the background. Most peoples of the Western civilizations accept the Hebraic account of the creation of the world as their guide. An early verse in the Book of Genesis says:

> And God said, Let the earth bring forth the living creature *after his kind*, cattle, and creeping thing, and beast of the earth *after his kind:* and it was so.

By interpretation and exegesis this came to mean that God had created each organism, animal and plant, in a fixed pattern and that the offspring retained this fixed pattern. In modern jargon there were *fixed species* and they *bred true*. This was the dogma of biological science, despite the expressed doubt of occasional individuals, until Darwin, in 1859, forced the acceptance of the fact of evolution. So thoroughly was this dogma ingrained that all departures from it were ignored and Lamarck's *Philosophie zoologique*, published in 1809, was so treated for fifty years. It was this dogma which actuated Cuvier's attitude toward Lamarck, and a word from the very influential Cuvier could damn or bless a biologist's work in those days.

With the acceptance of the fact of evolution Lamarck's work was immediately recalled and for a time was in high favor. There is a strange irony in the fact that the bond-breaking book which forced the acceptance of evolution was called the *Origin of Species*, for it has nothing in it concerning the origin of species beyond the author's repeated declaration (Keith says "in almost every chapter") that he knew nothing of the origin of *variations* in plants and animals—and variation is the origin of new forms, i.e., species. Naturally there was an immediate and eager search for the cause of variation, and Lamarck's theory gave a very plausible explanation. A need caused by the environment was reflected in the body as an inner feeling which led to a response, a variation in form; the response was inherited by the offspring and a new species had come into being. Lamarckism was accepted by a whole generation of ardent supporters, but every theory must stand examination and criticism and soon Lamarckism came to the question. There was immense activity in the biological sciences; space forbids detail, we can only glance at the critical points.

Weismann demonstrated the wide separation of the body from what he called the "germ plasm," meaning the ovum and sperm, or their botanical equivalents. The germ plasm is the only part of the organism which carries life to the next generation and it does it by actual transference of material and is therefore immortal. The body serves only to elaborate, nourish, and protect the germ plasm. How then could the increased strength of a claw or the color of a hair or feather affect the remote germ? An acquired character could not be passed on by the germ which had become as "untouchable" as the lowest caste of the Hindus. The origin of variation must be in the germ—the Lamarckian error of an external cause was killed for the *first* time.

Later the cytologists discovered the chromosome and demonstrated how the actual substance of the germ and ovum met and carried on in the next generation. Then the work of Mendel, another long-forgotten man, was resurrected, and we learned how definite characters were transmitted and much of the mechanism of the transfer. The *gene* was conceived, and the possible mixtures and permutations of the gene complex gave an explanation of the origin of variation. That was a *second fatal blow* to Lamarckism *if* the gene was, as originally conceived, a fixed, unchangeable entity governing a single character. It was fully demonstrated that neither the inner feeling nor the acquired character could have any influence on the succeeding generations.

The legendary Hydra had many heads, according to Bulfinch, seven. Six of these had power of regeneration so that if one was struck off there immediately grew two in its place; the seventh was immortal. It made rather a nuisance of itself in the way of an unrationed number of virgins for dinner and other black-market activities. Hercules, one of the original trouble shooters, was sent to abate the nuisance. He was a hero devoted to direct action and proceeded to knock off heads with his club; he made little progress for as soon as he abolished one head two appeared in its place. Mastering the strategy of the occasion he got his friend Iolaus to burn each neck as it was decapitated and soon reached the last head, which was immortal. As he could destroy it neither by club nor by fire he buried it under a great rock and then stuck his hands in the pockets of his lion skin and swaggered back to headquarters reporting the Hydra was dead—or *just as good* as dead.

Lamarckism has been something like that Hydra; whenever a head was knocked off, i.e., a portion was proved to be an error, it just redoubled itself and made a lot of trouble until it was utterly abolished. Then there was the immortal head which was buried under a mountain of proof, invective, and sarcasm; it just went on living and turning up at inconvenient times. It is a most interesting analogy that the original immortal Hydra head was buried under a great rock, for it has been the paleontologists, a queer group given to poking around among the rocks, that have kept unearthing the immortal error and breaking out with Lamarckism in a more or less virulent form.

The first law of Lamarckism that we have considered is that the organism had some feeling induced by the demands made upon it by its environment and that this feeling induced action which caused variation. The original giraffe of Lamarck's illustration, who first "stuck his neck out" and kept sticking it out more and more, was an unexplainable fact to Lamarck, who took refuge in a mysterious inner feeling, a bit of jargon that has been completely rejected, but today a new jargon of hormones liberated by a *desire* to reach a more remote leaf, of stimuli liberated by endocrine glands, even of the action of the subconscious have been pointed out as more pleasing terms. There is no reason, it has been asserted, why a hormone may not penetrate even to the untouchable germ. Error still writhes among his worshipers.

The second law that we are considering states that any change which took place in the body of an organism might be inherited. This was manifestly impossible so long as the germ and the soma were distinct entities and so long as the gene was untouchable. But what has happened? The "untouchable" of India is today demanding contact and influence in the body politic. The gene is having contact forced upon it.

Only the geneticist can guide us through the labyrinth of new conceptions and qualifications that have gathered around the gene since the Mendelian characters governed by the gene were rediscovered and exploited. First, there is doubt of the actual existence of the gene as a concrete entity. Second, in Julian Huxley's last book, *Evolution — The Modern Synthesis* (p. 62), we can read: "Today the notion of Mendelian characters has been entirely dropped. The term may occasionally serve as a useful piece of shorthand notation, but is in point of fact a false conception." A little later we read concerning the integrity of the gene to a single character:

"A single gene may affect a number of characters . . ." This may be done in three ways. "A gene may exert a direct effect on two or more distinct processes." "A gene may exert a direct effect on a single process, but in many different sites and conditions." "A gene exerts a primary direct effect, and this then causes numerous secondary effects." And so on until the gene ceases from its simplicity and direct action and becomes a most complicated admixture of possibilities, so elaborate and fragile that some workers are convinced that a change in the parent might disturb the fine adjustment and cause a variation in the offspring.

The gene is no longer untouchable and unchangeable. Morgan admitted it years ago in his address at Cornell. More recently Amram Scheinfeld in his book, *You and Heredity* (1939), said: "Does this mean that the gene can *never* change? No, . . . a change ('mutation') might take place at rare intervals in any given human gene, either spontaneously or through some *outside influence* about which we know very little." And again: "In fact, so interrelated and so dependent on each other are the forces of environment and heredity in making us what we are that they cannot be considered apart . . ."

The unbiased historian must record that the status of the gene, in the minds of some persons ignorant of the arcana of the geneticists, reminds him of Mark Twain's horse in Syria—after enumerating its many lacks in standard equipment and its various decrepitudes, he said, "I called him Baalbec, he was such a magnificent ruin." So much says history of the gene which slew all but the immortal head of Lamarckism.

The continuous disproof of Lamarckism has on the whole been conducted in a logical and restrained manner, but the enthusiasm engendered by a cause to fight for has sometimes exceeded the bounds of a generous struggle. There has been a tendency at times to brush aside as outmoded and reactionary all those who have failed to sacrifice at the shrine of the bright new god, to adopt Herculean methods and go after anyone suspected of Lamarckism with a club. Those who are old enough to have read Dickens will recall a certain Mr. Podsnap in the novel, *Our Mutual Friend.* According to the account of the story,

> Mr. Podsnap settled that whatever he put behind him he put out of existence. There was a dignified conclusiveness—not to add a grand convenience—in this way of getting rid of disagreeables which had done much towards establishing Mr. Podsnap in his lofty place in Mr. Podsnap's satisfaction. "I don't want to know about it; I don't choose to discuss it; I don't admit it!" Mr. Podsnap had even acquired a peculiar flourish of his right arm in often clearing the world of its most difficult problems . . .

This attitude Dickens called Podsnappery. The honest, if reluctant, historian must admit that something like Podsnappery is or has been present. I record one of the less-striking examples, leaving out all names and dates. A certain author recounts the sins of an advocate of Lamarckism who in overenthusiasm falsified the results of his experiments and upon exposure died by his own hand. The account of the tragedy ends with this moral, "Blank died shortly after [the exposure] by his own hand, and his death may well mark the end of the zoological error on which he wasted his life's work."

The repeated necessity of killing the error of Lamarckism recalls a story told by a returned antarctic explorer who lectured at this University. The party discovered a small crustacean called the ice bear, which spends most of its life inert in a mass of ice, but should a stray ray of sunshine or a rare warm breeze melt the walls of its prison, it springs into the activity of life and reproduction. The zoologist of the expedition became interested in its amazing vitality and tried in all ways to determine the limits of its viability. He froze, thawed, boiled, and poisoned the ice bear but with little effect. It became a bit of a mania with him. The lecturer said that it got so that they would be awakened in the night by some disturbance only to find that the zoologist had thought of some new way to kill the ice bear and had arisen to try it.

This is but a glimpse in the most meager outline of how the error of Lamarckism has refused to die. Lamarck let loose an idea on this earth, and it has had immense effect upon our lives and thoughts. Right or wrong, his thinking most aptly illustrates Browning's words: "A man's reach should exceed his grasp, or what's a heaven for?"

PREVENTING TRANSPLANTING SHOCK IN POINSETTIAS

By S. R. Hynes, F. F. Weinard and J. R. Kamp
University of Illinois, Urbana, Illinois

Soluble fertilizers which are relatively high in cost are less apt to be used for general greenhouse purposes than less soluble materials. At times, however, completely soluble fertilizers may be of particular value. This appears to be the case when plants are being conditioned for transplanting without transplanting shock.

With many greenhouse crops, any check in growth will result in poor plants throughout the remainder of the season. With some crops this check may be less noticeable, but nevertheless, equally important. When a plant is transplanted in the usual way, a considerable portion of the feeding root system is broken and new feeding roots must develop before top growth can be resumed. If that plant were ready to send out news roots at the time it was moved, the interruption of the growth process should be greatly minimized or eliminated entirely. It was proposed to accomplish this by feeding plants with a soluble fertilizer approximately one week before transplanting.

The soluble fertilizer used in this experiment was Take-Hold a combination of diammonium phosphate and monopotassium phosphate manufactured and distributed by the Victor Chemical Works.

Cuttings of the poinsettia "Indianapolis Red" were made on August 12, 1946. Four weeks later the rooted cuttings were potted in a mixture of three parts loam, one part manure, one-half part sand and one-half pound of superphosphate to a wheelbarrow load of the mixture.

On October 10, six lots of uniform plants in 2¼ inch pots were selected, 24 plants in each lot. On this date, Lot 2 was fed with "Take-Hold," 12 grams per liter of water, 25 cc. of the solution to a 2¼ inch pot. One week later, all of the plants were shifted to six-inch pans, three plants per pan. Eight pans per lot were included in subsequent treatment. The complete series was as follows:

Lot 1. No feed.

Lot 2. One feed (Take-Hold) one week before panning.

Lot 3. One feed (Take-Hold) one week after panning.

Lot 4. One feed (Take-Hold) at time of panning.

Lot 5. Fed (Take-Hold) every two weeks, beginning one week after panning.

Lot 6. Fed (ammonium nitrate, 3.6 grams per liter of water) every two weeks, beginning one week after panning.

All of the poinsettias in this experiment made satisfactory growth, but the plants in Lot 2 were outstanding. Their stems were somewhat longer, the plants had more leaves, and the bracts were exceptionally large. The total bract area of the plants in Lot 2, by actual planimeter measurement, exceeded the area of the next best lot (lot 1) by 55 percent.

Weekly counts were made of plant heights and numbers of leaves from November 1 to December 13. The number of leaves on the plants increased week by week up to the final count shown in Table 1.

It should be noted that, with the exception of those plants fed just prior to transplanting, there were no marked differences between the various lots. This was taken to indicate that the soil was sufficiently fertile for good growth and that no improvement could be had from additional fertilizer. The improvement in Lot 2 was, therefore, presumably due to the elimination of a check in growth. Apparently the prevention of transplanting shock in the handling of poinsettias is more important than any subsequent treatment.

TABLE 1. Comparative Development of Various Lots of Poinsettia Indianapolis Red

Lot No.	Average No. of Leaves per Plant	Average Height of Plants (inches)	Average Bract Area per Plant (sq. in.)
1	13.5	8.5	17.3
2	14.5	9.6	27.00
3	12.7	8.8	15.2
4	13.5	8.4	17.0
5	12.3	8.7	16.6
6	12.2	8.3	15.8

▽

THE SEROLOGICAL MUSEUM

By Alan A. Boyden, *Director*

The creation of the Serological Museum of Rutgers University has been announced in Science (1948, February 27) and in Nature (1948, March 20). It is dedicated to the principle that the proteins of the blood and of other tissues of the bodies of organisms may be as characteristic of them in health and in disease as are any of their other constituents and are as worthy of preservation and study as their skins and skeletons. The principal objects of this museum are several: (1) To build up by collection and exchange samples of as many kinds of proteins as are obtainable from all kinds of organisms, young and old, healthy and diseased; (2) To preserve as well as possible the representative proteins of the blood and other tissues and to study the means of improving the methods of preservation; (3) To study the methods used in comparative protein studies including those used by serologists; to learn as much as possible about the composition and properties of the samples collected; and to extend the serological comparisons to more groups of organisms as the availability of materials warrants. (4) To share the samples collected with competent workers in the field of comparative protein studies so far as the availability of samples collected makes possible.

The Serological Museum is administered by its officers aided by an Advisory Council. The officers are members of the staff of the Department of Zoology, and of the Bureau of Biological Research, of Rutgers University. Director — Alan Boyden, Secretary — Charles Leone, Director of Research —Ellis Bolton. The Serological Museum is now a part of the Bureau of Biological Research of Rutgers University, the facilities of which are available to the museum.

The primary materials sought by the Museum are the proteins of the bodies of organisms. The most readily obtainable sources of such proteins are the blood sera of animals. Accordingly we have need of the blood sera of all kinds of animals, vertebrate and invertebrate. The procedures recommended for obtaining such sera are given below. Such procedures may be modified in the future as improvements in methods are discovered, in which case modified procedures will be sent out to supplement the directions previously given.

The Serological Museum is in need of blood samples of *all* kinds. Hence we hesitate to speak of "special" needs. We need to collect sera of all animals from which such samples are obtainable whether vertebrate or invertebrate. Of the animals which can be readily bled, the Mollusca, Crustacea and Vertebrata are most common and samples of any of these phyla and any of their classes are sought. Among the Vertebrata our collection is weakest among the Reptilia and Aves. Among the Mammalia we have no samples or inadequate samples of the following orders: Monotremata, Insectivora, Edentata, Dermoptera, Chiroptera, Pholidota, Tubulidentata, Hyracoidea, and Sirenia. However, even our best represented order, the Artiodactyla, needs intensive collection and *no opportunity for obtaining the blood of any animal should* be needlessly lost. Duplicate and even multiple samples of the same species are needed for the solution of many problems in the future.

The procedures to be used will differ somewhat depending upon the facilities available at the time of the collection of the sample. The general procedures are as follows: I. *For the serum sample.*

1. Fresh blood is obtained:
   a. By cardiac, venous, or arterial puncture and bleeding into a syringe with transfer to a clean tube or jar, or b. By cutting some arterial or venous supply and collecting in a clean jar, or c. By collecting blood as it drips from a wound.

2. The blood is allowed to clot. It may then be gently loosened from the sides of the jar or tube to facilitate the expression of serum which may continue for several hours or overnight, keeping the blood sample cool but not frozen.

3. Pour off (or centrifuge off) the serum and add *one* preservative as follows:

   Preferred. a. Add one part* of merthiolate solution (concentration one part merthiolate in 1000 parts of water) to nine parts of serum, or *Next.* b. Add one part of 2% formalin solution (prepared by adding 2cc. of commercial formalin to 98cc. of water) to nine parts of serum.

4. The serum samples obtained should be properly labelled as to:

   a. Species, b. Number of individuals and sex represented in the sample, c. Locality and date, d. Collector, e. Approximate age and condition of health of animals, f. Preservative used.

5. The size of the serum sample will vary with the number and sizes of the animals bled. For large animals samples of 50-100cc. of serum, or more, are desired. In the case of such animals as whales for example, as much as a liter of serum may be readily obtained from one individual. For small animals any amount is acceptable, but a sample of 5cc. or more is desirable and larger samples are more useful. The sera of small animals may be pooled, provided they are all of the same species (and subspecies or variety if such categories are recognized). Duplicate samples, single or pooled, are desired.

6. After the serum sample is obtained and preserved it should be kept in a cool place. It is not necessary that the samples be frozen though this may be done if facilities are available to keep the materials frozen all the time. Alternate and repeated freezing and thawing should be avoided and the whole blood itself should never be frozen, though the serum alone may be.

7. Materials necessary for the collection and preservation of the samples will be provided if requested. Such materials include:

   a. Serum bottles, b. Preservations, c. Directions for special procedures if needed.

In regard to serum bottles, any clean bottles or jars may be used and even corks may be used in place of rubber stoppers. Ordinary commercial formalin may also be used which is normally about 35-40% formaldehyde. If the stock formalin solution available is weaker than that, the preparation of the dilution used for preservation must be corrected to give the equivalent of a 2% solution made from the stock 40% formaldehyde solution known as formalin. The 2% preserving solution should be made up about once a month or oftener if necessary using distilled water for the dilution where possible.

The merthiolate for use will be shipped as the dry powder. One-hundred milligrams of dry merthiolate added to 100cc. of water provides the 1:1000 solution to be used. This solution may be made up once in two months, or oftener as needed, using distilled water or saline if either are obtainable.

8. The serum samples should be carefully packed and shipped to:

The Serological Museum
Rutgers University
New Brunswick
New Jersey
U.S.A.

Ordinarily, Parcel Post would be used. Each individual bottle, carefully sealed, should be wrapped in its own covering of paper or cardboard and protected from the other samples and the walls of the container by excelsior, or straw, or cotton packing.

II. *For the blood smears.*

It is desirable that every individual blood sample be represented also by a blood smear made upon a glass slide in the usual way, but if, for any reason, it is impractical to obtain such a blood smear, *the serum sample should nevertheless be ob-*

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*See subsequent section I. 7. for preparation of solutions.

tained. Brief directions for preparing such smears follow:

1. Use a "working slide" and such smear slides as are needed. Both should be clean (rub dry after dipping in 95% alcohol if possible).

2. Touch one end of the smear slide to a drop of *fresh* blood.

3. Place the working slide in contact with the drop and the smear slide, allowing the drop to spread along the line of contact.

4. Hold the working slide at a 45° angle and draw it along the smear slide at a moderate speed. If too much blood was present on the slide the smear will be too thick for proper study. By interrupting the contact between smear slide and working slide and reapplying the working slide a few millimeters farther on, a better smear may be obtained.

5. Fixation is accomplished by air-drying followed by:

   a. One minute contact with absolute methyl alcohol, or b. Passing the smear slide through a flame two or three times.

6. If staining materials are available, one slide or each set of two or three each individual may be stained as soon as possible.

7. Avoid exposure of the slides to flies or other insects.
8. Label the slides in agreement with the labels of the serum samples and ship to the Museum as soon as convenient.

   Replacement slides will be supplied by the Museum if requested.

In addition to blood sera, proteins may be obtained from the other tissues of the bodies of organisms. For example, extracts of dried insects or other invertebrates too small to be bled may yield proteins of value in comparative serology. Certainly the tissues of animals frozen in ice could be used as the source of such extracts. If any collector is in a locality where such materials are available we hope he will inform us of that fact so that any further directions necessary may be supplied to him.

The Serological Museum will in the future publish and distribute subsequent issues of its bulletin. These will contain in summary form items of news about its program. We expect to report in the future:

1. Additions to the list of councillors.

2. A list of active collectors.

3. An inventory of samples available.

4. A list of new accessions and their contributors.

5. Brief abstracts of current researches sponsored by the Museum.

6. Corrections to procedures and special needs.

It is our hope that all individuals and agencies that are able to do so will begin to share in this cooperative enterprise of world-wide scope. Biological collecting expeditions of all kinds are requested to consider the desirability of making the simple arrangements necessary to obtain the materials needed by the Serological Museum. Comments and suggestions, criticisms, special difficulties in the field in obtaining or handling samples—reports concerning all such matters pertaining to the work of the Serological Museum are always welcome. Future progress in the field of general and systematic serology may depend in large part upon the extent and nature of the cooperative efforts of many individuals and agencies.

▽

Motto For A Laboratory

A. M. KEEFE

This is a scientific laboratory—for us who labor here the ground whereon we stand is holy. Within these walls we lay bare the secrets of nature, revealing to our age the wondrous workings of the Eternal Mind. "Order," says the poet, "is heaven's first law." Here, therefore, let all our thinking and working be orderly. Here let every preparation be careful, let every manipulation be cautious, every observation honest—above all, let every conclusion be based only on the facts patiently disclosed. *In all things let truth prevail.* We need not fear that any fact will ever be discovered which will give the lie to cold Reason or glowing Faith. "God does not contradict Himself," either in Nature or Revelation. Blessed are we who here may thrill in following the creative Hand of the living God. "By the greatness of the creature, the Creator may be seen—to be known thereby."

(Judith 13:5)

Out of the Woods

Successful fattening of poultry, hogs and cattle on chemically treated sawdust is reported at a meeting of the American Chemical Society.

—News item.

Go hustle up some redwood
And fetch a bit of pine,
For cattle now are fed wood,
And so, it seems, are swine.

The sawmill's busy whirring
Turns out, with every gash,
The stuff that, with some stirring,
Makes very yummy mash.

Here's Bossie, better feed her,
She's had a busy day.
Fill up her bin with cedar,
She'll never miss her hay.

And here a hen comes clucking,
Here waddles up a goose:
So start your mealtime chucking
Of tasty bits of spruce.

Rejoice, you farmer fellows,
And praise the chemist's brain.
In lofts the sawdust mellows
For all the world like grain.

No lack of food this winter
For fattening the stock.
There'll always be a splinter,
A chip from off the block.

Give thanks to mental giants
Who've done what seemed
incredible.
God made the tree, but science
At last has made it edible!

RICHARD ARMOUR.

(New York "*Times*" Sunday Edition)

The Kinsey Report

O Cupid! Cast away your bow and quiver—
Statistics prove your methods inexact.
O Donne! Go take a jump into the river—
You hymned the essence, but ignored the fact.

Locked in some cool aseptic heaven above
Trained statisticians painlessly inquire
Into the quaint geometry of love,
The quantitative aspects of desire:
Observe the conduct of the lovesick male
(Not passionate, not noble, not obscene),
Plotting it on a logarithmic scale,
Noting a random scatter 'round the mean.
O monumental volume, smug and fat!
Did Man, who wrote the Song of Songs, write that?
O God! O Kinsey! O Jehosaphat!

(From THE LANCET, London.)

EDITORIALS

"WHOM THE GODS DESTROY—?"

Instead of editorials for this issue, your editor submits four items selected from our American "Time," the Sydney, Australian, "Bulletin," and the most recent of all, the London "Times." These items give us reason to wonder if the fulfillment of the rest of our title quotation is too long off, and the blindness has not already descended. In these days of international insecurity these developments afford some solid hope that the end can not be too long delayed.

LIQUIDATED SCIENCE

"THE BULLETIN," Sydney
February 18, 1948

In a "Nineteenth Century and After" article on "Retreat from Science in Soviet Russia," Dr. C. D. Darlington, F.R.S., speaks of "Stalin's mistake" regarding Soviet scientists as being "part of a plan which included the dismissal of the geneticists and a great deal more besides."

"The first victims," states Dr. Darlington, "were in 1932 when G. A. Levitsky, the cytologist, and his pupil N. P. Avdoulov were sent to labor camps. Vavilov asked Stalin for their release, a request which was temporarily and grudgingly granted. At the same time B. S. Chetverikov, the pioneer of population genetics and W. P. Efroimson were sent to Siberia and nothing was heard of them for 15 years. In 1935 the first two geneticists, I. J. Agol and L. P. Ferry, were put to death. In 1937 the head of the great institute for medical genetic research in Moscow, S. G. Levitt, was put to death and at the same time probably Avdoulov. In 1939 N. A. Iljin, an outstanding animal-breeder, disappeared, leaving a posthumous paper to appear in the 'Journal of Genetics.' In 1942, not only Vavilov, but also his closest cytological colleague G. D. Karpechenko died ('in the fighting,' so it was said). At about this time J. J. Kerkis, the *Drosophila* geneticist, disappeared following a party-cell intrigue, and Levitzky was finally sent back to a labor camp, where he died. At about this time also N. K. Koltzov, the cytologist and doyen of Russian biology, died and his widow committed suicide."

"In a word," Dr. Darlington concludes, "after 13 years of persecution, the great fellowship of Russian biological research, formed in the revolution, had been crushed and broken."

"DEAR TEACHER . . ."

"TIME"
September 6, 1948

Professor Anton R. Zhebrak is a Soviet geneticist who has enjoyed international respect. Like most reputable scientists, he has believed in the Morgan-Mendelian theory of genetics (i.e., hereditary characteristics are controlled by genes which cannot be altered by ordinary environmental conditions). That belief made him a heretic in Russia, where science must take the Communist view that ENVIRONMENT IS ALL. Last year Zhebrak was roundly denounced by "*Pravda*" for admitting in the U. S. weekly, "*Science*," that many Russian geneticists still uphold Mendel's laws ("*Time*,") Sept. 22).

During the last fortnight Professor Zhebrak has recanted his heresy. "I, as a party member," said he in a letter to "*Pravda*," "do not consider it possible for me to retain the views which have been recognized as erroneous by the Central Committee of our party."

With Zhebrak's capitulation, a debate that has gone on in Russia for over a decade came to an end. Henceforth, all vegetables, flowers and other plants in the U.S.S.R. will grow straight along the Marxian line. Under the vigorous influence of their Communist environment, they will cast off all Western bourgeois tendencies that might make them follow their heredity.

The man who finally won the long-standing argument is Geneticist Trofim Denisovich Lysenko, president of the Lenin All-Union Academy of Agricultural Sciences. Lysenko rose to his present eminence by being able to make his science toe the party line. Although Lysenko has gained increasing recognition in Russia, most Western and some Soivet geneticists have regarded his party-line genetics as scientifically naive.

This summer, at the eight-day meeting of the Lenin Academy, Lysenko rose to insist on his views once again. Several scientists, including Professor Zhebrak, tried to start the old argument. It was then that Lysenko sprang his big surprise: his theory had been officially endorsed by the Central Committee.

Taking its cue, the Academy hastily dashed off a note to Scientist Stalin: "You, my dear leader and teacher, have helped Soviet scientists day in, day out, to develop our progressive materialist science serving the people in all its labors and exploits, a science expressing the ideology and lofty aims of the man of the new Socialist society. . . . Advanced bioligical science rejects and pillories the erroneous idea that nature cannot be guided by the human control of conditions."

Last week the Academy swung into action. It purged itself of two of its most noted members: Physiologist T. A. Orbeli and Morphologist I. I. Shmalgauzen; liquidated a laboratory on cytogenetics (the study of cell formation), and accused its director, world famous Geneticist N. P. Dubinin, of having taken "anti-scientific positions." All text-books on biology were ordered rewritten; teaching will be oriented to the Lysenko doctrine.

"SCIENCE AND FREEDOM"

"THE BULLETIN," Sydney
September 1, 1948

An incident reported from the U.S.S.R. should make those young scientists who believe that defense secrets must be at the service of the whole world pause to think. It is not an isolated incident — Professor Ashby and other visitors to the Worker's Only Fatherland have reported long ago that such matters are part of regular policy.

The incident relates to the sad cause of Comrade T. A. Orbeli, who has been sacked from his post as academic secretary of the biological section of the Soviet Union Academy of Sciences. It appears that he had failed to "place biology at the service of the vital needs of socialist construction." Tovarish Orbeli is one of a large group to be purged from U.S.S.R. science. It appears that they fail to co-ordinate their scientific work with the interests of the country for the development of Communism. In other words, they take the same stand as Dr. Makinson and the Australian Communists who follow him—that their science belongs to the world.

A few Australian "intellectuals" . . . who dicker on the fringes of Communism might study with advantage some of the well-authenticated word-pictures of what happens in Russia to scientists who do not place every ounce they have exclusively at the service of the Soviet Union—exclusively:—

> "Huddled together on narrow wooden benches, with thin, sharpened down dinner-knives in hand, sit professors and other educated and cultured men. In front of them are bags with dirty, rotten potatoes which in "capitalist" country would not be used even to feed pigs; and here these men sit diligently, seriously and clumsily peeling such potatoes for prison soup. . . . Highly-qualified engineers compete for the right to do plumbing jobs, repair locks, electric lighting and telephones. Learned professors claim the jobs of polishing floors and cleaning stairs. One clergyman, until his execution, was in charge of the boilers."

That was written by Vladimir Tchernavin, a Russian ichtyologist well-known throughout the world in his sphere at one time—leader of expeditions to Central Asia and the Far East, in 1925 Director of Production and Research of the Northern State Fishing Trust, who was arrested as a "wrecker" and used to organize forced labor in the fishing industry until he succeeded in escaping. As "Soviet Justice," an official Russian journal dealing with the criminal law, put it: "A Commission of the Commissariat of Justice, after touring the prisons, reported that class-alien elements are being kept under strict observation, and are sent exclusively to hard-labor tasks."

In Russia a man who was inclined to give away so much as the formula for a new cotton-reel to non-Communist countries would be regarded as a "class-alien." In the 1938 Moscow trials, according to the official report, one of the statements adduced against a prisoner to support a capital charge was that he told a British woman Red Cross worker, who had risked her life to take a unit to Kiev to relieve the sufferers in the famine of 1932-33, what the wheat production of the Ukraine actually amounted to. This charge was put forward by no less a person than Mr. Vishinsky, now Russian Foreign Minister, as "spying for a foreign Power" and "wrecking."

"SOVIET DENIAL OF PRINCIPLES OF WESTERN SCIENCE"

"THE TIMES," London
November 6, 1948

Wherever scientific research goes on there are minority groups of scientists. These minorities consist of men whose work does not entirely convince other scientists, although judgment is suspended as to the value of their work. During the past 10 years there have been two important minority groups of biologists in the Soviet Union. One group, led by Gurevitsch, asserts that radiations can be detected from living matter. The other group, led by Lysenko, challenges the laws of inheritance as revealed by half a century of genetical research, and substitutes a completely different system of ideas, called Michurin genetics.

It can be confidently said that no reputable Soviet biologist takes either Gurevitsch's or Lysenko's work seriously. Neither Gurevitsch nor Lysenko publishes his principal results in the scientific journals of the Academy. To judge from recent issues of the *Comptes Rendus* of the Academy of Sciences, biological research in modern Russia is as orthodox as respectable as biological research in Britain.

How is it, then, that Gurevitsch remains among an obscure minority and Lysenko features in the headlines? How is it that a man whose knowledge of orthodox science might not qaulify him to matriculate in a British university managed last August to eliminate his scientific opponents and to become the leader of biological research in Russia? One can suggest three reasons. The first is that Russian scientists cannot distinguish sound science from chicanery; the second is that Lysenko is in fact right and the rest are wrong; the third is that Lysenko's leadership is not due to his scientific achievements but to some other qualifications he has.

Michurin Genetics

The first of these three reasons can be dismissed at once. Soviet scientists are fully as intelligent as scientists elsewhere. They can see through specious argument and bogus experiment as quickly as their British and American colleagues. The second possible reason cannot be discussed without some knowledge of what Michurin genetics is about. Michurin genetics arose in the nineteen-thirties from the vague but dogmatic notions of Michurin, a clever Russian horticulturist, who lived from 1855 to 1935. Like Luther Burbank, Michurin had green fingers and an eye for a plant. Like Burbank, he occupied his leisure by trying to rationalize his skill through fantastic and naive theories. These theories amounted to a powerful faith that through grafting and other horticultural techniques it was possible to change the natures of plants profoundly, and that only timidity and lack of skill prevented men from making plants, like clothes, to fit every sort of need.

Michurin's main contribution to Soviet biology, and in particular to Michurin genetics, is this unreasonable optimism. It is precisely the contribution that Soviet biology required, for in modern Russia all agricultural activity is expressed in terms of struggle: the struggle against drought, or pests, or frost; the struggle to complete spring sowing or to bring in the harvest; the struggle to increase yields. The munitions for this struggle are to be supplied by the biologist. Therefore to believe (as Michurin believed) that nurture can always prevail over nature, provided enough effort is made, is essential for the morale of a Soviet biologist.

Practical Successes

It is not surprising that a young and zealous Ukrainian agriculturist, Lysenko, found in Michurin's writings exactly the inspiration he needed.

Through bold improvisations and a shrewd knowledge of peasant phychology Lysenko introduced several changes in farm practice which had beneficial results. By planting potatoes in the Ukraine in midsummer, so that they ripened in the cool autumn, Lysenko increased the yield of potatoes in the south. By sowing grain in last year's stubble instead of in ploughed land Lysenko caught the thin layers of drifting snow and saved crops from drought in the east. During the war by cutting potato "seed" into small pieces (a practice well known in parts of England) Lysenko enabled bigger crops to be raised in the north. Here was a man the peasants understood, and he became their demagogue.

There was nothing philosophical about these achievements, and it was not until later on that a facade of Marxism-Leninism was laid over the practical work that Lysenko had done. It is not easy to decide how or why the philosophy crept in. A plausible explanation is that Lysenko's excursions into science (his theory of phasic development of plants and his claim to transmit characters in plants by grafting) failed to convince Soviet biologists. The demagogue of peasants found himself to be small fry in the Academy. The most formidable of Lysenko's critics were geneticists. For the orthodox geneticist nature cannot be moulded by nurture, except slowly and unpredictably. The experimenter who wants to change the nature of plants or animals quickly finds the laws of Mendel standing in the way. So much the worse for the laws of Mendel; according to Lysenko they represent defeatism, the decadent bourgeois, not the aggressive socialist, attitude to nature.

It was at this point that the official Soviet philosophy came to Lysenko's aid. With the help of a philosophical colleague, Prezent, Lysenko asserted that the adherents of Mendelism were anti-Marxist, and were therefore traitors to the State, and that, while orthodox geneticists were pottering with their futile experiments, Michurin geneticists were raising the level of Soviet agriculture. The general public did not realize that Lysenko's practical successes were accomplished in spite of, and not because of, his curious opinions about science.

In 1943 Lysenko rationalized his peasant skill in an extraordinary pamphlet called "Heredity and Its Variability." From this pamphlet, and from the experiments performed at his institute, it is possible to assess Lysenko's claims. He attempts to discredit genetics by three arguments. The first is that genetics is contrary to Marxism-Leninism and is therefore a heresy; the second is that genetics does not lead to useful practical results and is therefore a waste of effort; and the third (and least important) is that experiments on grafts done by Michurin and himself are inconsistent with Mendelian laws. The first two arguments are mere sophistry and deserve no more comment. As to the experiments, any reputable biologist who would challenge half a century of research must offer the world data of his own which are beyond reproach; Lysenko's data would be unacceptable even as a student's exercise in an agricultural college.

It is evident from these considerations that Lysenko's success cannot be explained on the assumption that he is right. The third hypothesis to account for the triumph of Michurin genetics is that Lysenko's work is valuable to the State for reasons other than its scientific integrity or its philosophical orthodoxy. There is evidence to support this view. Inertia has always been a serious weakness among Russian *intelligentsia*. Oblomovs paralyzed nineteenth-century Russia, and there is no room for them in the Bolshevist State. If science is to be harnessed to the State it must be led by confident extroverts, preferably extroverts who will take short cuts and get results quickly. This is Lysenko's flair. Without proper quantitative tests, without critical treatment of his data, Lysenko introduces new practices which succeed and new theories which do not succeed; and it is what Lysenko does on the farm, not what he says in the Academy, which interests the Soviet Government.

Link With Peasants

Beside this, Lysenko is enormously important to the Government as a bridge between themselves and the peasant. Soviet agriculture is still unstable. Only a year ago there was a purge on collective farms, and serious unrest among farmers would be a menace to Soviet economy. Is it not possible, therefore, that the "agronom" who comes to the farm with Lysenko's formula for the pre-treatment of seed is (perhaps unknown to himself) a nerve-ending from the Kremlin? Only on such a hypothesis as this does it seem possible to explain the great attention given by the Government to the somewhat flatulent proceedings of the Lenin Academy of Agricultural Sciences, of which body Lysenko is the president.

For many years Lysenko has been a great figure in agriculture, but until last August his scientific activities (however much advertised in the popular Press) were dwarfed by those of the flourishing schools of traditional genetics in half a dozen laboratories in Russia. Until last August it was quite untrue to say that orthodox biology was suppressed in Russia. In Moscow University the official genetics text was an American book in which the names of Michurin and Lysenko are not even mentioned. On August 26, 1948, all this was changed. By a decree of the Council of the Academy of Sciences half a dozen leaders of genetics in the Soviet Union are deprived of their duties, and the illustrious Institute of Cytology is to be abolished. Editorial committees are to be purged of non-Michurin biologists. The syllabus in school and university is to be revised to eliminate bourgeois biology. The Academy abjectly apologizes for neglecting Lysenko and encouraging servility to foreign "pseudoscience."

It is improbable that these violent decisions are made merely in the interests of philosophical conformity. It is much more likely that they are intended to safeguard the practical man, to set a seal on the tendentious rather than the objective approach to agricultural science, and to keep control of the activities of the Russian peasant. This is not the first time that there has been persecution of scientists in the Soviet Union, but the persecution has never before been official and uncamouflaged. For this reason the Academy decree of August 26 may be regarded as the first official break from the traditions of western science. It is a decision in complete contradiction to public statements by the president of the Academy a year ago. It is a decision which has shocked scientists all over the world.

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FRONTS FOR ACTION

I am grateful that higher education has many fronts on which to work in these days of rethinking and reshaping knowledge—the front of the state-supported college and university, the front of the private college and university, the large college, the small college, the men's college and the women's college.

Variety in education, as well as in other things, is American. It is American because it tends to preserve independence and individuality. The public-supported institutions insure the principle of democratic opportunity for all; the private college preserves education from a prevailing pattern of state-control; the small college stands as a bulwark against the academic goosestep of mass education. We put each other in balance, as it were, lest one good educational custom should corrupt the nation.

Differ though we do in size, organization and program we have one task in common. Together we are charged to give almost 3,000,000 young men and women an education which they will know *how to use* for their own ongoing personal development and for the good of society. — *From Inaugural Address by President Katherine Gillette Blyley, Keuka College.*

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BOOKS

OUR PLUNDERED PLANET, by FAIRFIELD OSBORN, Little Brown and Company, Boston, Mass., $2.50.

After all the fuss made over this work by the news commentators in the press and on the air, this reviewer may be pardoned if he laid it down with a rather cynical: "Old Stuff." Many of the things the well known author has said in this small book have been long since, and to our taste, better said by Dr. Paul B. Sears, former National Chancellor of Phi Sigma. In his two books, "Deserts on the March" and "This Our World," published in 1935 and 1937 respectively by the University of Oklahoma Press, he outlined many of the ideas enunciated so pontifically by Dr. Osborn. Strangely enough Dr. Sears' two books were extensively reviewed at the time, and received what appeared to be a considerable amount of publicity. Yet Osborn's bibliography and reading list, neglect any mention of Dr. Sears or his publications.

It is perhaps one of those ironic twists of the Fates that Dr. Sears' works appeared when the U.S.A. was on the upgrade out of the 1928 depression. There wasn't too much fear or insecurity in the country then. The pollyannaish spirit of the times wasn't interested in any professional Casandra warning of the shape of things to come.

It is perhaps wierdly significant of our present-day fears and insecurity that the reading public is so willing to swallow any horrors imaginative authors can conjure up. Dr. Osborn and his staff in the New York Zoological Society timed the entrance of their brain child onto the literary scene very shrewdly. With the dire prophecies of the election candidates on the air in this country, and rumors of wars all around the world, the stage was well set to give this new book an amount of publicity which is far out of proportion to its importance.

To our mind there has been on this subject, as Shakespeare so shrewishly remarked, "much throwing about of brains." All the current prophets of biological disaster seem very careful in their tales of terrors to come to omit any reference to the known but not-too-well-publicized Brückner cycles, and the possibility that we may be in one of the so-called "dry periods." When the colder "wet" eventuates, we shall probably be equally deluged with crocodile tears about the inundations to come. To us the "long view" is one of the world's most acute needs here and now.

As Alice in Wonderland nibbled one side of the toadstool and became shorter and shorter, she said: "curioser and curioser!" This book is the first American publication in a long time we have seen coming on the book stands without an index.

ANSELM M. KEEFE, Ph.D.
The Editor.

ADVANCES IN GENETICS, by M. DEMEREC, Editor. Vol. II, Academic Press Inc., 125 East 23rd St., New York 10, N. Y. $7.50.

Seven papers include Ernst Caspari of Rochester on "Cytoplassmic Inheritance," Gunnar Dahelberg of Uppsala on "Genetics of Human Populations," W. E. Heston of Bethesda on "Genetics of Cancer," Sally Hughes-Schrader of Columbia on "Cytology of Coccids," Ernst Mayr of the American Museum on "New Systematics and the Nature of Species," E. R. Sears of U.S.D.A. and Missouri on "Wheat Cytology and Genetics," and D. G. Catchesdie of Cambridge on "Genetic Effects of Radiations." The book is well indexed, the coccid article is illustrated, and each article has a copious bibliography.

ANIMALS ALIVE, by AUSTIN H. CLARK, D. VanNostrand Company, Inc., New York. $4.00.

This is one of those informational and informal books which supply so much of the background information about animal habits and idiosyncrasies which textbooks almost universally omit. If those zoology professors who are still addicted to ancient and yellowed lecture notes were to brush up on books like this there would be less joy in college-land on their retirement.

BASIC FISH COOKERY, by Rose G. Kerr, U. S. Dept. of the Interior, Washington, D. C.

This is the sort of a clear-texted and well illustrated pamphlet many a man wishes his cook had available when his catch comes to the table in an unrecognizable and tasteless condition.

BIOLOGY FOR HIGH SCHOOLS, by M. Dafrose, P. J. Kenedy and Sons, New York. $2.60.

Written from the teleological standpoint to be expected of a nun, this looks intriguing enough to challenge the interest of almost any teen-ager. It is profoundly illustrated, almost every illustration being tied into the text by leading questions. There is an almost astounding amount of historical detail as well. About the only criticism the book merits is the profuseness of matter offered.

BIOLOGY OF THE VERTEBRATES, by H. E. Walter, The Macmillan Co., New York. $4.75.

This is the eighth reprinting of the 1939 revised edition of a well known and highly esteemed textbook by the emeritus Professor of Biology at Brown University which has appeared unchanged almost annually for a decade, a well-merited tribute to a good text.

BOTANY OF THE LIVING PLANT, by F. O. Bower, The Macmillan Co., New York. $8.00.

This is one of the classic texts for advanced botany in Great Britain but we suspect that over there it is placed in the hands of a much younger caliber of students than on this side of the Atlantic. This fourth edition has been considerably revised to a point where it can be said to be practically completely modernized.

DISEASES OF FIELD CROPS, by James G. Dickson, McGraw-Hill Book Company, Inc., New York. $4.50.

Dr. Dickson's position in one of the leading agricultural colleges of the country, as well as the fact that he is not only the successor but also a student of the late Dr. L. R. Jones, one of the nation's greatest plant pathologists, gives this work a position of authority in the field of plant diseases that cannot be safely underestimated. Diseases of both the cereals and grasses as well as of the legumes, the fiber crops and tobaccos are all covered in a scholarly and scientific fashion. In view of the plethora of plant-affecting diseases, Dr. Dickson is wise in restricting the field of this 400-page text to the fiield crops.

EXOTIC AQUARIUM FISHES, by William T. Innes, Innes Publishing Co., Philadelphia.

This is the ninth edition of this standard work by the indefatigable editor of "The Aquarium," popular magazine for fanciers of tropical or exotic fish. The book contains all the practical and helpful material regarding fish rearing and aquarium maintenance found in its predecessors, as well as much new material. What makes it most interesting, almost fascinating, is the very large number of color photographs of the many tropical and native aquarium fish. The personality of the author shines through this work as much as it does in his excellent magazine.

FISH PONDS FOR THE FARM, by Frank C. Ediminster, Charles Scribner's Sons, New York. $3.50.

One of the striking features of the Philippine landscape at least in the more-or-less maritime provinces of Pangasinan, Lingayen, Pampanga, and Bulacan, is the large number of private fish ponds along the roadsides, setting off the homes and forming an effective yet practically useful barrier between the public and private domain. This was probably copied from, or introduced by the Chinese, who had become quite a power in the prewar Philippines.

There is no seeable reason why the rural American, be he farmer or landowner should not enjoy the pleasure of having his own fish pond and his own fish to catch and eat. This book gives not only the history, but the theory and very valuable pointers on the practice of private fish raising. That this book would do its part in educating our American Farmer to a new and profitable source of food materials is a consummation devoutly to be desired.

FOUNDATIONS OF SILVICULTURE, by J. W. Toumey and C. J. Korstian, John Wiley and Sons, Inc., New York, N. Y. $5.00.

The dean of the Duke University Forestry School has considerably revised the original Toumey text in this second edition. He has fortunately kept the original theme—the ecological basis of silviculture, and the book is infinitely much more than a "how to do it" manual, it strives to give most of the "reasons why?" This reviewer has been using the text as the basis of a one-semester, three credit course, not so much for pre-forestry but as a cultural part of his botanical offerings. It is well adapted to the purpose. The emphasis on ecological factors is a most desirable feature, synthesizing the pertinent phases of biological, geographical, meteorological knowledge into one coherent whole. To the professional forester the book persents a challenging and on the other hand interesting viewpoint, the correlation of site, atmospheric, and physiographic factors with the adaptation of three groups to environmental conditions.

A.M.K.

GENERAL ENDOCRINOLOGY, by C. D. Tuiner, W. B. Saunders Co., Philadelphia. $6.75.

This is one of the few outstanding *new* textbooks to appear in the post-war years. This is not hard to understand. During the pre-war years endocrine research was developing by leaps and bounds, and to such an extent that no one was willing to take the responsibility of putting out a definitive text in the field. Now that the printing restrictions of the war years, the paper shortage and the like have alleviated to some degree, it is time that someone should enter the field with a well organized manual. That the Associate Professor of Zoology at Northwestern University, himself a teacher of endocrinology at the undergraduate level, should see his way to fill these needs of modern biological education is a pleasure to announce. The book is up to the usual level of Saunders excellent production, with 349 illustrations and what appear to be very complete bibliographies at the end of each chapter.

S.C.B.

GEORGE CRILE AN AUTOBIOGRAPHY, edited by Grace Crile, J. B. Lippincott Co., Philadelphia. $10.00.

With the passing of Dr. George Crile in 1943 the last chapter of the story of that great group of middle western medical men which included Charles and William Mayo, and John B. Murphy came to a reluctant close. Dr. Crile was a great personality whether one agrees with his ideas or not. The compilation of this autobiography out of his writings and speeches was begun by his wife. In his later years he became interested in her labor of love, and recast much of it into the first person. The result makes good reading, covering as it does the discoveries, events, and contacts of a very full medical career from the time of his graduation from medical school in 1887 on for a span of over half a century. The two volumes deserve a place on every biographical library shelf.

GERMAN-ENGLISH SCIENCE DICTIONARY, by Louis De Vries, McGraw-Hill Book Co., New York. $4.50.

The Professor of Modern Languages at the Iowa State College, with the assistance of the Graduate Faculty, has prepared this larger and revised second edition of which this is the third impression. The high positions of the collaborating group in the production of this handy and extremely readable reference work is a warrant of its usefulness.

GRAY'S ANATOMY OF THE HUMAN BODY, by Charles Mayc Goss, Lea and Febiger, Washington Square, Philadelphia 6, Pa. $14.00.

Forty-seven, three column pages of some eighty entries each give some idea of the extent of the subject index of this twenty-fifth edition of the standard text in human anatomy which first came into the field just ninety years ago. There are 1263 illustrations, a very large number of them in color. Gray's Manual is to the study of human anatomy almost what the Bible is to religion. This twenty-fifth edition will not decrease its usefulness or popularity as a text.

INTRODUCTION TO PLANT ANATOMY, by A. J. Eames and L. H. MacDaniels, McGraw-Hill Book Co., New York. $4.50.

This second edition of one of our few standard texts on plant anatomy marks some advances over its predecessor. The history of the field has been omitted in order to give more room to the expanded chapters. This revision will keep all the friends its predecessor made, and will gain new ones. Not only plant anatomists will want to have it, teachers of general botany will fiind it a valuable record for handy reference.

KNOWING YOUR TREES, by G. H. Collingwood and W. D. Brush, The American Forestry Association, 919 Seventeenth St., N. W., Washington, D. C.

Ten years ago the first copy of this attractive work appeared under the aegis of the A.F.A. Since that date it has gone through eight reprintings, two of them revisions. This third revision presents some 150 American trees embellished with over 800 illustrations and distribution maps. Many of the photographs of the deciduous trees have been made from the same spot giving comparative data as to the summer and winter habits of the same specimen. There are no typical cultivated fruit trees included,—neither are some of the rarer, more local or imported forms,—as for example the tung tree (Aleurites), or the chinaberry (Sapindus). Tree lovers will want this new edition. It will be a valuable adjunct to school libraries. A.M.K.

LABORATORY DIAGNOSIS OF PROTOZOAN DISEASES, by Charles F. Craig. Lea & Febiger, Washington Sq., Philadelphia, Pa.

The second edition of Craig's valuable manual on the "Diagnosis of Protozoan Diseases" is to be welcomed in that it includes many techniques which were developed or proved more thoroughly during World War II. It is to be welcomed also in view of the fact that physicians and laboratory workers have become progressively more conscious of the parasitic protozoa. This book should prove invaluable to these workers.

J. Teague Self.

LABORATORY EXERCISES: BIOLOGY OF PLANTS, by H. L. Dean, Wm. C. Company, Dubuque, Iowa. $2.00.

This series of laboratory exercises first came on the scholastic market in 1944. Its reappearance this year in a new edition speaks well for the author's understanding of the needs of modern botanical classes. The secret is perhaps the use of large drawings for labelling, thus eliminating the grotesqueries perpetrated by so many of today's freshmen whose high-school training seems to leave something to be desired. The use of the completed drawings, sketches and tabulation outlines should eliminate a lot of waste motion and leave time for a much more thorough treatment of the various assignments.

LABORATORY GUIDE FOR ANIMAL BIOLOGY, by A. M. Elliott, Burgess Pub. Co., 426 South Sixth Street, Minneapolis 15, Minnesota. $2.75.

This laboratory manual is different from the preceding one in that it presents comparatively few completed drawings and leaves considerable leeway for the instructor to assign drawings to be made or for the entry of additional data. This technique gives the student more time for thorough inspection of his material and consultation,—a much needed factor which can be verified by experienced teacher of general zoology who has watched students concentrating all their attention on the drawing exercise material alone.

MANAGING SMALL WOODLANDS, by A. Koroleff and J. A. Fitzwater, American Forestry Association, 919 Seventeenth St. N. W., Washington, D. C. $1.00.

"This simply written booklet — a practical guide in woodland management—is designed especially to aid the owners of small forest properties." So says the foreword to this publication which because of its horse-sense and excellent format deserves to the widest possible distribution. The amount of practical information packed into this handy booklet is surprising.

A TEXTBOOK OF HISTOLOGY, by A. A. MAXIMOW and WILLIAM BLOOM, W. B. Saunders Co., Philadelphia, Penn. $8.50.

The fifth completely revised edition of this standard text will keep all its old friends and add new ones. The format has been improved by double-columning the pages. There are 562 illustrations, many of them new, and 32 in color. The extraordinary completeness of the work is best summed up in the fact that it has an index of thirty-seven pages, each with three columns over fifty typed lines long of items cited. Names of the authors or titles of articles in the rather full chapter bibliographies are not included in the index.

G.A.

WAY OF THE WILDERNESS, by CALVIN RUTSTRUM, Burgess Publishing Company, 426 So. 6th St., Minneapolis 15, Minn. $2.50.

This interesting and somewhat out-of-the-ordinary manual comes to you with a limp cloth-textured cover, neatly enclosed in a dark olive green braid-trimmed packet. What comes out of the book is even more surprising, for this work deals with preparations for, and techniques to use, in the far "outback" of Ontario, Manitoba, and Saskatchewan, — and kindred places. Among other helpful facts offered there may be mentioned the chapters on travel "by way of canoe," "by way of pack animals," "by way of dog-teams," "afloat with a pack," as well as on personal equipment and on wilderness recipes and menus.

BROAD CURRICULUM IS NEEDED TODAY

"Educational institutions need comprehensive two-year courses in Natural Science, Social Science and Humanities," declared Dean Harry James Carman of Columbia University in his Founders Day talk to the University of Akron faculty and interested students.

"In order to understand today's complex society we must insist on a broad, balanced, curriculum. There is a need to organize new courses but not on a superficial survey basis. All students should be required to take the same two-year course regardless of their chosen field.

"The two-year Humanities course would include one year devoted to reading the great books, and the second year the student would be required to take music and art; philosophy, literature, music, and art teach moral life. Students will learn that human good can take diverse forms.

"Man has lost faith in man. Men are suspicious and fearful of one another. Psychologists, psychiatrists, sociologists, and anthropologists should pool their efforts to teach personal relationships which will restore faith.

"There is a definite relationship between cultural and vocational courses and they should not be divorced. Cultural courses properly taught have vocational implications."

In speaking of education for the future Dean Carman declared that the adults of tomorrow must solve national problems, such as our racial and labor problems, and international ones, as knowing how to deal with Russia and the Orient.

"Education should be a liberating education that frees men from superstition, prejudices, and fear, and that allows them to become masters of themselves.

"Men have more time for leisure. By discovering their latent talents and devoting them to the betterment of the community, they will lead a fuller life. Educational institutions should help them discover their talents."—University of Akron *Buchtelite.*

PHI SIGMA NEWS

COUNCIL MEETING

Two new interim officers have been named by the national council of Phi Sigma, biological fraternity in a meeting at St. Norbert college on 9 and 10 September.

Dr. Arthur I. Ortenburger, professor of zoology at the University of Oklahoma, was named interim chancellor to succeed Dr. Paul E. Warren of Tufts, Mass., college. Dr. Warren recently resigned the post which he had held since 1932.

Dr. Henry van der Schalie, curator of mollusks of the museum of zoology at the University of Michigan, was named national secretary to succeed Dr. Ortenburger.

The council set Dec. 29-30 for the annual winter meeting of all chapters of the fraternity. The meeting will be held at the University of New Mexico at Albuquerque.

Courtesy of the Green Bay PRESS-GAZETTE

The Council of Phi Sigma, biological research society, is shown during a meeting at St. Norbert college, whose dean, the Rev. A. M. Keefe, O. Praem., standing left, is editor of the fraternity's magazine, The Biologist. Other council members are: Dr. Henry van der Schalie, seated left, secretary, University of Michigan; Dr. A. I. Ortenburger, chancellor, University of Oklahoma; Dr. Karl F. Lagler, vice-chancellor, University of Michigan; and Erwine Hall Stewart, standing right, treasurer, Mesa, Colorado.

A MESSAGE FROM YOUR CHANCELLOR

In accordance with long established custom and constitutional requirements I hereby proclaim to the chapters of Phi Sigma that the Council has approved a National Meeting to be held at the University of New Mexico, Albuquerque, New Mexico, on Wednesday and Thursday, December 29, 30, 1948.

A scientific program will be an important part of this National Meeting and it is the sincere desire of the Council that each and every chapter will be well represented.

Since it is no longer possible for us to meet with the American Association for the Advancement of Science we are now "on our own" as are many other associated and affiliated societies. It is most fortunate that we have a most cordial invitation from the University of New Mexico and Phi Sigma through its delegates will, I am sure, have a most successful meeting there.

We should remember that even though there is business to transact as is always true at a National Meeting, that this is not the primary purpose of getting together. To me, the scientific sessions are of much greater value—this has been the case in the past and no doubt will be in the future.

Each chapter should remember that the delegate elected fills an important position. The assembled delegates constitute the governing body of Phi Sigma—Constitution, Article II, Section 4(c) "Such National Meeting shall be empowered to transact any and all business relating to the welfare of the Society as a whole." Your Council serves the national organization between National Meetings in accordance with the wishes of the delegates expressed at such a meeting.

It should then be obvious that the choice of the delegate and alternate by each chapter is something to be done carefully and with considerable thought. Choose your representative as the one active member whom you wish to trust and as one in whom you have real faith as a person of good sense, judgment, and reliability.

At your forthcoming meeting I will be merely the presiding officer—your delegates will in all cases make the decisions which must then be followed until our next meeting at least.

Our meetings have always been most successful — I am certain that this one will be the same.

A. I. ORTENBURGER
Chancellor

THE UNIVERSITY OF
NEW MEXICO
ALBUQUERQUE

November 5, 1948

Dr. Anselm N. Keefe, Editor
St. Norbert College
West De Pere, Wisconsin

Dear Dr. Keefe:

I have been pleased to learn that the Phi Sigma Society has accepted the University of New Mexico's invitation to come here for the 1948 National Meeting which will be held during the Christmas Holidays.

The University of New Mexico Chapter of Phi Sigma has been functioning since April 21, 1935. As a result of the meetings which have been held and the emphasis which is placed on scholarship and research, the Alpha Nu Chapter has made important contributions to University life. The fact that the National Meeting will be held here on the campus will give additional prestige to the local group.

I feel certain that the delegates and other interested persons attending the conference will enjoy their stay here. It is our sincere hope that a large number will be present. If we can do anything to add to the success of the meeting, I hope you will call on us. It is a real pleasure to welcome you on to the campus of the University of New Mexico.

Sincerely,
TOM L. POPEJOY
President

TLP/mt

THE SCENE OF OUR FORTHCOMING MEETING

By Dr. E. F. Castetter

The University of New Mexico, Dept. of Biology

President Tom L. Popejoy, 9th executive officer of the University officially assumed office July 1, 1948. A native of the state and for 24 years in the employ of the University, the last few years as comptroller, President Popejoy is popular with students, faculty and alumni.

As Phi Sigma prepared for its national convention at the University of New Mexico December 28, 29, and 30, the University itself was busy with plans as host. Its planning took place in a setting which is unique among American universities. In architecture, in cultural and racial backgrounds and customs, and to a great extent in climate, New Mexico is unlike any other place.

Biologists, members of other UNM science departments, and the Graduate School, as well as President Tom L. Popejoy and other administrative officials, were working with Dr. Edward F. Castetter on program and entertainment plans. To them, the New Mexico atmosphere is an accustomed thing, and yet it is forever new, forever stimulating and surprising. This should apply especially to visitors, who no matter how they travel, will come to Albuquerque off the desert or mountain into the valley of the Rio Grande and into a lovely town of Spanish, ranch and adobe architecture, with the University an architectural center.

Many an imaginative scientist has traced the institution's style from its ancient sources, as from Chaco Canyon prehistoric Indian apartment houses through Taos Pueblo and the Spanish Colonial and ranch-house developments to the present modifications, best exemplified in the University's Administration Building, Library, and dining and residence halls —and particularly in the President's House, which derives directly from the two-storied houses at Taos Indian Pueblo. Some of the campus buildings are of adobe brick, but other materials have been used more recently, with the same exterior appearance.

Thirty-four buildings stand upon a part of the campus, with extensive land holdings sprawled around the green areas, off beyond an 18-hole golf course and into the desert mesa country. With its own wells the institution keeps its campus proper and the golf course in bloom, and although winters can get cold at Albuquerque, 5000 feet above sea level and nestling at the foot of the Sandia Mountains, the nearly constant sun sometimes shines on flowers still in bloom near Christmas-time.

New Mexico's climate is difficult to comprehend without experiencing it. Lying where it does, not at all in the "south" and a mile above sea level, it would seem almost certain to be a cold place; but actually Albuquerque's climate is mild, and there are long winter spells of the brightest sun and warm days, when even a suitcoat may seem unnecessary. Part of this condition is due to the state's aridity; there is a very low level of atmospheric humidity, and soil and air are so dry that there is no such thing as the sticky heat or the humid and chilling cold that can come with low temperatures in humid climates.

Students and faculty, even those who have been at the University a long time, marvel at the constancy of the sun. Albuquerque has between eight and nine inches of rain a year, which means that days are nearly cloudless. There are occasional small rains, and once in a long time there is a heavy rain—and there are winds and sand storms at times, too, especially in the spring.

New Mexico is a state of three cultures; the Indian, the Spanish, and the so-called "Anglo." Within the state are the Pueblo Indians, men who from centuries back have lived in villages each with its own entity, and there are also the Navajos, nomads and sheepherders and jewelry-makers, and the Apaches, once the most warlike of tribes and now a settled agricultural group.

The Spanish strain, which accounts for perhaps 40 per cent of the total population, came in from Mexico more than four centuries ago with the Conquistadores and is evident in surnames throughout the state. Old Albuquerque is an ancient Spanish town, separate from Albuquerque proper, and populated almost exclusively by Spanish-Americans and a tourist's paradise of restaurants, shops, and the Church.

This is the milieu in which the University of New Mexico has grown. Established in 1889, the institution is relatively young—it was a "state university" before New Mexico in 1912 became one of the United States, "intended to be one of our state universities when New Mexico shall be admitted as a state in the Union." For decades the young school struggled to find itself and develop its organization.

Taken from the top of one building, a part of the 400-acre campus is shown with buildings in the background.

Said to be the most beautiful building in the southwest, the UNM library is a shining example of the modified Spanish Pueblo architecture.

When the state "found itself" it did it in its own way: it was wise enough and vigorous enough and independent enough to keep its character, and so as it developed, as New Mexico and as nothing else, the University also began to grow.

This growth has been out of proportion to that of most state universities. Highest semester enrollment before the war had been under 1800. Now enrollment is between 4900 and 5000. Faculties have grown from a total of a score or so to nearly 300, and new buildings have risen not nearly fast enough to keep pace. Temporary structures from Army posts have been spotted across the campus, doing no good to the unity of its beauty but a lot of good to students and faculty desperately in need of quarters. Under President Popejoy new buildings are constantly getting under way, with a hope that within a few years all departments, and especially the sciences, can be well housed.

The natural sciences always have led the way at UNM. In physics a graduate and research program involves two main lines of investigation: atmospheric physics and cosmic radiation, and there are six Ph.D. candidates. In geology there is a program of cooperative work with the U.S. Geological Survey involving oil and coal, metals, oil-company investigations, minerals investigations, and a study of Pennsylvanian fossils in the state. Chemistry is busy with explorations in the synthesis of imidazolines and imidazolidines, in formation of addition compounds of tellurium and titanium tetrachlorides, preparation of phosphors, synthesis of derivatives of chaulmoogric acid, electroplating, and measurement of distribution coefficients between water and immiscible solvents.

Biology is at work in developmental physiology and enzymes, invertebrate zoology (synecology, and taxonomy and ecology of the arthropods); taxonomy and autecology of the vertebrates, absorptive capacities of higher plants, primitive Indian agriculture and utilization of plants and animals by the Indian peoples, antigenic aspects of the enteric pathogens, and dynamics of disinfection and lyophilization and its effect on viability of microorganisms.

Under Dr. Castetter's adminstration, the department has developed from a one-professor venture to a staff of nine full-time members and eight graduate assistants, with departmental enrollment increasing from 85 to 1000. The department is housed in four buildings, and has 75 majors. The master's degree is offered, and candidates for the Ph.D. degree in biology will be accepted in 1949. Members of the department are: Edward F. Castetter, Ph.D.; William J. Koster, Ph.D.; Howard J. Dittmer, Ph.D.; Richard B. Johnson, Ph.D.; C. Clayton Hoff, Ph.D.; Douglas G. Humm, Ph.D.; Martin W. Fleck, M.S.; De Witt Ivey, M.S., and Ward L. Sims, M.S.

Alpha Nu chapter of Phi Sigma was organized April 21, 1935, with 30 charter members. Membership is open to undergraduate and graduate students and to faculty members. Officers this year are: President Larry J. Gordon, Vice-President Ferd Sumrell, and Secretary-treasurer Diana Hinman. Mr. Gordon is the delegate to the annual meeting, and Miss Hinman is alternate. Among the New Mexico chapter's activities is the annual awarding of the Phi Sigma medal to the member who has shown the greatest ability and progress in the biological sciences.

The University's College of Arts and Sciences, under Dean Thomas C. Donnelly, and the Graduate School, under Dean France V. Scholes, who is also Academic Vice-President of the University, have given emphasis to research in the natural sciences. The program of graduate instruction, initiated in 1919, offers the master of arts and master of science degrees in anthropology, art, biology, chemistry, economics, education, engineering, English, geology, government, history, mathematics, modern languages, philosophy, physics, psychology, and sociology. A master of music

More and more students from Latin-America are enrolling at the University of New Mexico because of its fine School of Inter-American Affairs. Here, the students from south of the border feel quite at home with this distinctive architecture.

degree and a bachelor of business administration degree are offered. The doctor of philosophy degree is offered in American civilization, anthropology, biology, chemistry, English, history, physics, and Spanish, with training available for candidates in physics, chemistry and biology at the Los Alamos Scientific Laboratory. In addition to the colleges and schools mentioned, there are seven other colleges, namely: General, Education, Engineering, Pharmacy, Fine Arts, Business Administration, and Law. The Institution also operates a School of Inter-African Affairs.

University research agencies are the Bureau of Business Research, the Division of Government Research, the Division of Research and Development, the Engineering Experiment Station, and the Institute of Meteoritics; and the State of New Mexico operates its State Health Laboratory and its State Highway Department Testing Laboratory on the campus. Dr. Myrtle Greenfield, council representative of Phi Sigma, is director of the health laboratory.

Biologists express amazement at what happens when water can be got to New Mexico's apparently sterile soil. With enough water, luxuriant growth occurs, under the warm and almost constant sun. Said an old-timer, once, in Albuquerque: "Ah, if there were only plenty of rain, these hills and mesas would be covered with verdure." But then, he said, it wouldn't be New Mexico.

* * *

CHAPTER OFFICERS AND NEWS LETTERS

BETA

—University of Michigan

President—Charles E. Friley, Jr., Div. Mammals, Museum Zoology, University of Michigan, Ann Arbor, Michigan.

Vice-President—Brahma S. Kaushiva, Department of Zoology, University of Michigan.

First Secretary—Perry M. Johnston, Department of Zoology, University of Michigan.

Second Secretary—Ralph E. Morrill, 2607 Pittsfield Blvd., Ann Arbor, Michigan.

Treasurer—James A. Peters, 2019 University Museums, University of Michigan.

EPSILON

—University of Denver

President—Charles L. Jarboe, 1914 So. Monroe, Denver, Colorado.

Secretary-Treasurer—Jack Stimpfling, 950 Navajo St., Denver, Colorado.

Faculty Sponsors—Dr. and Mrs. Frederick Zeiner, 1417 So. Elizabeth St., Denver, Colorado.

Last spring we had two mountain field trips besides our regular meetings.

This fall we had a meeting introducing the new members to Phi Sigma. We are planning initiation in the near future. Our regular meetings include either a film or a speaker.

The following initiates' names have not been in *The Biologist:* June Alexander, James V. Bellizzi, Ralph R. Denton, Gordon R. Freeman, Rexford G. Haycraft, John J. Hood, Charles L. Jarboe, Joseph H. Marion, Amos P. Maxwell, James W. Pulver, Maynard N. Stamper, Jack Stimpfling.

ZETA

—University of Wisconsin

President—Thomas Theis, Department of Plant Pathology.

Vice-President — August Gorenz, Department of Plant Pathology.

Recording Secretary—Peter K. Nelson. Department of Botany.

Corresponding Secretary — Phoebe Green, Department of Botany.

Treasurer—Acton R. Brown, Department of Agronomy.

ETA

—University of Akron

President—Mr. Billie G. Messe.

Vice-President—..............................

Secretary—Miss Nina Mamay.

Treasurer—Mr. Robert P. Baker.

In our last chapter report of May, 1948, our records of membership through March 1948 were given.

In June 1948, Mrs. Esther Thompson was initiated into active membership at a meeting on Sunday, June 20, at the home of Dr. and Mrs. Walter C. Kraatz. Also the following persons were pledged to the society: Miss Joanne Korb, Mr. Edward Schneir, Mr. William Stockton, Mr. William Robinson.

We are planning to have an open meeting October 29 in hopes of raising interest in biological research. A very unusual biological movie will be shown.

We have the usual loss of good members by graduation, but are a little more fortunate than in many recent years, in having three of the four officers who served during the second semester of the school year 1947-48, still in school after their graduation. In the case of the other, secretary Eugenia Mamay, who has gone to Western Reserve University, is replaced by her sister Nina Mamay who will be able to follow along in this capacity admirably.

KAPPA

—University of Kansas

President—Arthur Chapman, 101B Haworth Hall, Anatomy Department.

Vice-President—Fred Truxal, 326 Snow Hall, Entomology Department.

Secretary—Dorothy Taft, 411 Snow Hall, Botany Department.

Treasurer—Charles Smith, 216 Snow Hall, Zoology Department.
Faculty Adviser—Mrs. Ruth McNair, 307 Snow Hall, Biology Department.
Council Representative—Irwin Baird, 117 Snow Hall, Zoology Department.
Alternate—Luther Buchele, 500 Snow Hall, Bacteriology Department.

A number of the Kappa Chapter members left us last spring. Here are the names of a few of them and their new locations: Wayne Porter, Ph.D. '48, Iowa State Agricultural College, Ames, Iowa; Loy Morgan, Georgia Coastal Experiment Station, Tifton, Georgia; Herbert Wallace, Iowa State Agricultural College, Ames, Iowa; Carlon Pryor, Little Rock Junior College, Little Rock, Arkansas; Luke Ponder, Kansas City Junior College, Kansas City, Missouri; Frank Emmerson, M.A. '48, Cornell, Ithica, New York.

The Kappa Chapter plans to continue holding noon meetings bimonthly.

We have not held our fall initiation yet, but a list of initiates will be sent to you when it is held.

LAMBDA

—Montana State University

President—John VanLandingham, 3000 South Higgins Street, Missoula, Montana .
Vice-President—Pat Dehnert, 501 University Avenue, Missoula, Montana.
Recording Secretary—Betty Hyde, 501 University Avenue, Missoula, Montana.
Council Representatives—Dr. L. G. Browman, 664 South 6th Street, East, Missoula, Mont. Dr. R. A. Diettert, 155 Mount Avenue, Missoula, Montana.

NU

—Washington and Jefferson College

President—Edwin Carter, 149 South Wade St., Washington, Pennsylvania.
Vice-President—Joseph Bozzo.
Secretary—Charles C. Wunder, 156 South Lincoln St., Washington, Pennsylvania.
Treasurer—Harold Parks.

PI

—Emory University

President—Branch Howe, Jr., Department of Biology.
Vice-President—Wallace W. Taylor, Jr., Department of Biology.
Secretary—Claude T. Adams, Department of Biology.
Treasurer—Robert E. Gordon, Department of Biology.

At the last meeting of the Spring Quarter sixteen new members were taken into Pi Chapter. They are: Claude T. Adams, David C. Albritton, Billie L. Bryant, William M. Byrd, Dan Callahan, Frank R. Camp, Jr., Robert E. Gordon, Branch Howe, Jr., Edwin H. McDowell, Jr., Gid Parrish, Jr., George S. Rogers, Richard T. Ross, David H. Spechler, William A. Strozier, Jr., Charles R. Underwood, Julian L. Veatch.

Activities during the Summer Quarter included a talk by faculty member Dr. Alvin V. Beatty on "Research Problems," and a watermelon cutting at the home of faculty member Dr. R. C. Rhodes, which was well attended by Chapter members and their friends. Beginning with the present school term, the Chapter is to have charge of at least one of the departmental seminars each quarter. Various other plans are pending, with several objectives in view, not the least of which is to make Phi Sigma, its aims and purposes better known on the campus.

RHO

—University of Illinois

President—Robert C. Honea, 151 Nat. Hist. Bldg., University of Illinois, Urbana, Illinois.
Vice-President—Edward W. Daniels, 338 Nat. Hist. Bldg., University of Illinois.
Secretary—John E. Porter, 125 Nat. Resources Bldg., University of Illinois.
Treasurer—Clifford C. Roan, 107 Harker Hall, University of Illinois.

Initiated at the University Y.M.C.A. on 18 March 1948 were: Faculty: Dr. William R. Horsfall; Animal Husbandry: Mark Henry Bert, James Edward Corbin; Bacteriology: Elizabeth B. Deane; Entomology: Hubert Jack Walters, Clifford Creighton Roan; Geology: Karl Joseph Koenig, Ernest J. W. Irish, Harold R. White; Horticulture: Robert G. Emge, Goah A. Lynch; Home Economics: Ruth V. Keys, Winifred M. Combs; Psychology: Stanley N. Roscoe, Henrietta V. Williams;

Zoology-Physiology: Ta-Hsiung Chin, Leatrice Wai Ling Chung, Daniel B. Comroe, Edward W. Daniels, Neva N. Gleason, Marvin M. Hensley, John Forbes McClellan, Lowell S. Miller, C. William Nixon, Alice Richards, Irving B. Sachs, Dana P. Snyder, Reuben Torch.

SIGMA

—University of Florida

President—Jon L. Herring, Department of Biology, Gainesville, Florida.

Vice-President—S. Kendrick Eshleman, Department of Biology, Gainesville, Florida.

Secretary—Ernest D. McRae, Jr., Department of Biology, University of Florida.

Treasurer—George K. Reid, Jr., Department of Biology, University of Florida.

Faculty Adviser—H. K. Wallace, Ph.D., Department of Biology, University of Florida.

Council Representative—Jon L. Herring, Department of Biology, University of Florida.

We are having election and initiation this month and I will have the secretary send you a list of the new members. We Phi Sigma members here at the University of Florida are most happy to cooperate with the Biologist in any way possible, as we are extremely interested seeing more good issues of same.

UPSILON

—Miami University

President—Donald Doan, Ogden Hall, Miami University, Oxford, Ohio.

Vice-President—Belva Laughlin, Walls Hall, Miami University.

Secretary—Dorothy Kleinhenn, North Hall, Miami University.

Treasurer—William English, Swing Hall, Miami University.

PHI

—University of New Hampshire

President—Charles McLaughlin, Forestry Bldg., University of New Hampshire, Durham, New Hampshire.

Vice-President—Richard Kerwin, Nesmith Hall, University of New Hampshire.

Recording Secretary — Lois Milbury, Nesmith Hall, University of New Hampshire.

Corresponding Secretary — Leonard Wolfe, Nesmith Hall, University of New Hampshire.

Treasurer—Harvel Winkley, Forestry Bldg., 108 Portland St., Rochester, New Hampshire.

Council Representative and Sponsor—Dr. C. F. Jackson, Zoology Dept., Nesmith Hall, Durham, New Hampshire.

Just before school closed last spring a group of about 15 members went on our annual spring outing. This time we decided to go to the Wild River section up in the North country and spend a couple of days. Friday, the weather gave promise of a very clear weekend. One or two cars left that night so as to get things set for the rest of the group. Shortly after they left it began to rain and continued until we returned.

The camp was set up in the National Forest Camp area and this was used as headquarters for our stay, although before we broke camp we wished we had a boat under us.

By noon, Saturday morning, everyone making the trip had arrived and in spite of the rain started off in various directions. A few climbed West Royce Mountain, or rather to use the words of the group, "swam up the mountain with feet dragging . . . also down." A few tried their luck at fishing and came back with the usual catch—nothing—not even a bite. The remainder of the group swam around the area collecting Botany and Zoology specimens.

That night when everyone had returned to camp and eaten supper we all gathered around the camp fire and sang songs. The singing continued, to the beat of the rain, for several hours. The only reason we stopped singing was because everyone began to lose their voices and I imagine that the wild life around us was glad that we stopped.

About Sunday noon we broke camp and returned to Durham. Everyone enjoyed the outing very much in spite of the rain, and it was still raining when we arrived in Durham Sunday night. Plenty of wild life, birds and small game, had been seen so our trip was well worth the wetting received.

Incidentally, no one even caught the sniffles.

For our fall outing a small group went to the University of New Hampshire Forestry Camp in Passaconaway, New Hampshire. This time the weather was wonderful—not a drop of rain all week end. Several of the mountains were climbed in the area, Mt. Hedgehog, Mt. Passaconaway, Birch Hill and trips to Church Pond, Sawyer Pond, and Lilly Pond.

Much more collecting was done on this trip. One reason perhaps was because one member of the group is writing her Master's thesis on the flora of that area. Also a few of us did some collecting for a graduate Botany course in Taxonomy.

It was a very pleasant week end and we were able to observe several very good beaver dams and slides. There are no new names to add at present but in about four weeks the new members will be known.

CHI

—Montana State College

President—Norman Anderson, Route 4, Boseman, Montana.

Vice-President—Doris Humphrey, 204 South Third St., Bozeman, Montana.

Secretary—Charles A. Purkett, 522 West Main St., Bozeman, Montana.

Treasurer—Jean Dorset, Quad F, Montana State College, Bozeman, Montana.

PSI

—University of Washington

President—Robert R. Stapp, Jr., 5026 16th Ave., N. E., Seattle 5, Washington.

Vice-President — Robert L. Burgner, 4111 42nd Ave., N. E., Seattle 5, Washington.

Secretary—Mary M. McCabe, 5043 Fifteenth Ave., N. E., Seattle 5, Washington.

Treasurer—Norman B. Johnson, 853 Rainier Hall, University of Washington, Seattle, Washington.

Council Representative—Dr. M. H. Hatch, 4623 21st N. E., Seattle 5. Washington.

OMEGA

—University of Oklahoma

President — Earl Kilpatrick, Zoology Department, Norman, Oklahoma.

Vice-President—Marie Unzner, 707 W. Boyd, Norman, Oklahoma.

Recording Secretary — Patsy Fowler, Biology Department, Norman, Oklahoma.

Treasurer — Glenna Swanda, Norman, Oklahoma.

ALPHA ALPHA

—University of Southern California

President—John M. Pierson, 236-23rd Street, Santa Monica, California.

Vice-President—Leroy W. King, 3517 Delta Street, San Gabriel, California.

Recording Secretary — Bernice Porteous, 445 North Irving Boulevard, Los Angeles, California.

Treasurer—Howard A. Winter, 4234½ Kenwood Avenue, Los Angeles 37, California.

ALPHA BETA

—Mount Union College

President—Jack Barnard, White Hollow, Mount Union College, Alliance, Ohio.

Vice-President—Doris Luginbuhl, 115 South Park Ave., Alliance, Ohio.

Secretary—Thelma Hill, 1928 S. Union Ave., Alliance, Ohio.

Treasurer—Jack Shanewise, Sigma Nu House, 1413 S. Union Ave., Alliance, Ohio.

Faculty Advisers—Dr. A. V. Hunninen and Prof. O. H. Engle.

Council Representative — Prof. O. H. Engle.

Our Chapter includes an active membership of 44. We have planned a splendid program for the year with addresses by Doctors from Alliance and Canton and a guest speaker from the Biology Department of our neighboring university, Kent State. Our first program was held Oct. 14th. The speaker was Dr. George King, President of our Board of Trustees and a local ear, eye, nose and throat specialist. Two of our best meetings of last Spring were an address, illustrated by colored movies, given by Dr. Wild, a local surgeon and a banquet followed by a lecture on the Philippines and Schistosomiasis given by Dr. A. V.

Hunninen of this Department. The following includes the new initiates: Robert Bay, Joseph Benedetto, Wilbur Birthelmer, Richard Cain, Henry Cramblett, Mary Margaret Crites, William Dawson, Joanne Donaldson, Tom Dunston, Sue Everhard, Charles Familia, Emogene Floto, James Hale, Milton Hood, David Leffler, Richard Leffler, Robert Mitzel, Richard McPherson, Ruth Ann Noble, Joyce Papworth, David Peterson, Donald Pinkerton, Robert Phillips, Robert Ritchie, Louise Brooks Sloan, Raymond Strecker, Donna Terrill, Andrew Veg, Charles Whitehouse.

ALPHA EPSILON

—University of Pittsburgh

President — Martin Yavorsky, Mine Safety Appliance Research Company, Craft Ave., Pittsburgh 13, Pennsylvania.

Vice-President—Mima Milliron, Arlington Apartments, Pittsburgh 13, Pennsylvania.

Recording Secretary — Mrs. Dorothy Schiff, 3465 Beechwood Blvd., Pittsburgh 17, Pennsylvania.

Corresponding Secretary — Irene Boccella, 6107 Alder St., Pittsburgh 6, Pennsylvania.

Treasurer—Richard P. Hartman, 602 North Euclid Ave., Pittsburgh 6, Pennsylvania.

ALPHA ETA

—Oklahoma Agricultural and Mechanical College

President—W. C. Rhoades, Entomology Department, Stillwater, Oklahoma.

Vice-President—F. B. Cross, Jr., 1515 W. 9th Street, Stillwater, Oklahoma.

Recording Secretary—M. C. Bachman, Zoology Department, Stillwater, Oklahoma.

Treasurer—G. E. Hall, Box 104, V. V., Stillwater, Oklahoma.

ALPHA IOTA

—Bucknell University

President—Robert Batten, 431 W. C., Bucknell University, Lewisburg, Pennsylvania.

Vice-President — Bowdain Berninger, 323 E. C., Bucknell University.

Secretary-Treasurer — Jack Wolansky, S.A.M. House, Bucknell University.

ALPHA KAPPA

—Hunter College

President—Barbara Orski, 31-71 45th St., Long Island City, New York.

Vice-President—Erica Joshua, 245 Fort Washington Ave., New York 22, New York.

Secretary-Treasurer — Helen Kangos, 269 Audubon Ave., New York 33, New York.

Council Representative—Rose Grandinetti, 3315 Broadway, New York 31, New York.

The following were initiated into Alpha Kappa Chapter on Sunday afternoon, June 27, 1948: Jane Bancroft, Jean Casale, Martha Dresner, Irene Gabriel, Renée Grant, Anita Haack, Helen Kangos, Sonja Miriam Korn, Dvorah Elinar Lederer, Anne Schumacher Loop, Gladys Mary Mateyko, Marilyn Soifer, Gloria Judith Stromberg, Rose M. Terrazzino.

ALPHA LAMBDA

—University of Utah

President—John C. Downey, Salt Lake City, Utah.

Vice-President—Earl W. Smart, Salt Lake City, Utah.

Recording Secretary — Betty Gunderson, Salt Lake City, Utah.

Treasurer—Ernest J. Roscoe, Salt Lake City, Utah.

Council Representative — Dr. William H. Behle, Department of Biology, Salt Lake City, Utah.

ALPHA MU

—University and State College of Oregon

President—Ken Walker, 947 N. 11th, Corvallis, Oregon.

Vice-President — Bob Sowell, Zoology Department.

Secretary—Ida Fredell, 231 N. 26, Corvallis, Oregon.

Treasurer — Eugene Haydu, A-14 5 Adair Village, Oregon.

Faculty Adviser—Dr. C. H. Martin, 322 N. 21st, Corvallis, Oregon.

Council Representative — Kenneth Walker.

The activities of Alpha Mu chapter last spring term consisted of one meeting a month at which time some topic pertinent to Biology was presented. Dr. Frank Smith of the Botany Department gave an interesting talk on Iris hybridization which he has been carrying on entitled "The Iris and Wild Flowers of Oregon." Walt Vincent and Bob Yancey student members showed colored slides on the Crater Lake region for one meeting. Dr. Ralph Huestis from the University of Oregon gave an unusual talk on "Is Modern Man *AN* Organism" and our adviser last year Dr. Ethel Sanborn spoke on fossil leaves.

Twenty six were pledged and initiated. They were: Ida Fredell, Charles Warren, Gilbert Byers, Eugene Haydu, Merl Payne, Frank Raymond, Donald Twohy, Laura Burgess, Arthur Hansen, Mary Hoit, Virginia Palmer, Aryan Roest, John Deatherage, Elvis Dickanson, Don Russell, Floyd Ellertson, Denis Illige, Walter Lesher, Robert Merriam, Donald Reish, Ernest Retzlaff, Robert Sowell, Raymond Underhill, Anita Van Arsdel and Kenneth Walker. We were also very happy and proud to initiate as an honorary member Dr. H. P. Hansen, professor of Botany and General Science.

This term has been darkened by the passing of one of our honorary members Dr. S. M. Zeller professor of plant-pathological research. He was an active member and the chapter will miss him greatly.

ALPHA NU

—University of New Mexico

President—Larry J. Gordon, 200 North Maple Avenue, Albuquerque, New Mexico.
Vice-President—Ferd Sumrell, Varsity Village, University of New Mexico, Albuquerque, New Mexico.
Secretary-Treasurer — Diana Hinman, Den Road, Stanford, Connecticut (Summer); Hokona Hall, University of New Mexico (School Year).
Publicity—Roger S. Wotkyns, Department of Biology, University of New Mexico.

ALPHA XI

—Rhode Island State College

President—Henry Bessette, Fort Kearney, Narragansett, Rhode Island.
Vice-President — Bernice Anderson, E. R. Hall, R.I.S.C., Kingston, Rhode Island.
Secretary—Gertrude Leacy, North Annex, R.I.S.C., Kingston, Rhode Island.
Treasurer — Margaret Gilbert, Kingstown Road, Kingston, Rhode Island.

Our Faculty adviser is Dr. Donald J. Zinn, Zoology Department, R.I.S.C., Kingston, Rhode Island. Dr. Zinn is also our Council Representative for this year.

Last year saw Alpha Xi back on its pre-war schedule. The regular business meetings were held every third Wednesday. Once a month we sponsored a speaker from other colleges at an open meeting. Our annual banquet was the scene of initiating this fall's officers, featuring the college President, Dr. Carl R. Woodward as guest speaker. Entertainment was provided by local talent. In May Alpha Xi had its annual picnic and field trip combined. This wound up our Spring semester. Our plans for this year include speakers that will represent the three fields in our organization, Zoology, Bacteriology, and Botany. Every business meeting will be followed by a speaker from one of the departments or a movie on a current subject. In this way we hope to make every meeting count. We are planning to enter the New England Biological Conference and have started our projects early. The publication of the "Cell" our local magazine is well under way and has promised to be bigger and better than ever.

The list of initiates for this Fall is as yet not complete.

ALPHA OMICRON

—Marquette University

President—Alvin Rieck, 1309 West Locust Street, Milwaukee 6, Wisconsin.
Vice-President—Howard Suzuki, 1682 North Marshall Street, Milwaukee, Wisconsin.
Recording Secretary — Kathleen Nevins, 1012 South 74th Street, West Allis 14, Wisconsin.
Treasurer — William Feierstein, 2222 South 14th Street, Milwaukee, Wisconsin.
Corresponding Secretary — Mary E. Turgeon, Apt. 403, 920 East Mason Street, Milwaukee 2, Wisconsin.
Chapter Councilor (permanent local representative) — Joseph A. Gillan,

4638A West Medford Avenue, Milwaukee, Wisconsin.

Faculty Adviser—E. S. McDonough, 253 N. Pinecrest Avenue, Milwaukee, Wisconsin.

Our program for the year is as follows: Tuesday, October 19, 1948: "Notes on the Genetics, Physiology, and Cytology of *Schizophyllum commune* Fries," Dr. E. S. McDonough, Biology Department, Marquette University; Tuesday, November 23, 1948: "Thyroid Physiology in Lower Animals," Dr. Eldon D. Warner, Biology Department, University of Wisconsin, Milwaukee, Election of New Members; Tuesday, December 14, 1948: "Adventures of a Naturalist in the American Southwest" (Illustrated with Kodachrome), Mr. Alvin Throne, Biology Department, Milwaukee State Teachers College, Christmas Party, Initiation of New Members, Refreshments; Tuesday, January 11, 1949: "Studies in Paramecium," Mr. Peter Monaghan, Biology Department, Marquette University, "Direct and Indirect Effect of X-Radiation on the Wall of the Developing Brain Vesicles of the Early Chick Embryo," Rev. J. P. O'Brien, C.V.S., Ph.D. and Miss Maureen J. Tobin, Biology Department, Marquette University; Tuesday, February 15, 1949: "Sesame and Light," Dr. James C. Perry, Biology Department, Marquette University; Tuesday, March 15, 1949: "Aspects of Bacteriological Research," Dr. A. L. Kappus, Department of Pathology and Bacteriology, Marquette University School of Medicine, Election of New Members; Sunday, March 20, 1949: Annual Phi Sigma Lecture, Time, Place, and Speaker to be announced; Sunday, April 24, 1949: "Safari in Africa," Mr. Murl Deusing, Curator of Education, Milwaukee Public Museum, Annual Banquet, Initiation of New Members; Tuesday, April 26, 1949: Laboratory Demonstrations of Research, Election of Officers; Sunday, May 8, 1949: Annual Phi Sigma Picnic.

ALPHA PI

—University of Colorado

President — Karl Raven, 955 Penn. Street, Boulder, Colorado.

Vice-President — Sheila Counce, 1134 Pleasant, Boulder, Colorado.

Recording Secretary—Kathleen Dever, 1545 Walnut, Boulder, Colorado.

Treasurer—Ruth Ann Wolf, 118 McKenna, Boulder, Colorado.

Council Representative—Mr. Karl Raven, 955 Penn., Boulder, Colorado.

ALPHA RHO

—University of Arkansas

President — Rolan Howell, Box 1102, Veterans Village, Fayetteville, Arkansas.

Vice-President—Niel Fulton.

Secretary—Ann Ruth Brummett.

Treasurer—Robert Ott.

ALPHA SIGMA

—University of Texas

President—A. J. Rowe, Jr., Zoology Department, University of Texas, Austin 12, Texas.

Vice-President—James H. Leech, Zoology Department, University of Texas.

Recording Secretary — Julius A. Keoschewsky, Botany Department, University of Texas.

Treasurer—J. A. Johnston, Zoology Department, University of Texas.

Council Representative—Addison Lee, Botany Department, University of Texas.

Reporter — Russell Garland, Zoology Department, University of Texas.

ALPHA TAU

—National University of Mexico

President—Dr. Eusebio Davalos Hurtado, 2A Merced Gomez 32, Mixcoac, D. F., Mexico.

Recording Secretary — Miss Johanna Faulhaber, Dept. de Antropologia Fisicz, Museo Nat'l de Antropologia, Moneda No. 13, Mexico D. F., Mexico.

ALPHA UPSILON

—University of California

President — Kenneth Norris, Zoology Department, University of California at Los Angeles, California.

Vice-President — Sol Kishlansky, Botany Department, University of California at Los Angeles.

Secretary — Esther Richter, Zoology Department, University of California at Los Angeles.

Treasurer—Shogo Yamaguchi, Botany Department, University of California at Los Angeles.

ALPHA PHI

—College of Puget Sound

President — Howard Bowman, College of Puget Sound, Tacoma, Washington.
Vice-President—Robert Alexander, Rt. 3, Box 165, Puyallup, Washington.
Secretary — Thelma K. Gloyde, 8856 Edgewater Dr. SW, Tacoma, Washington.
Treasurer—Dr. Murray Johnson, 3810 N. 35th St., Tacoma, Washington.
Faculty Advisers and Sponsors—Prof. James R. Slater and Dr. Gordon D. Alcorn.

On April 15 we initiated: George Taylor Fairfax, Robert Clifton Johnson, Richard Duane Paulson, all actives, and Weldon Willis Rau of the Faculty.

Initiation Insignia

Does your Chapter carry out the Ritual of Initiation properly? In other words, has your Chapter the model Phi Sigma Key and the large Phi Sigma Coat of Arms required by the Ritual? They are both in easy reach of every Chapter's finances.

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Treasurer of Phi Sigma,
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PHI SIGMA

BIOLOGICAL HONOR SOCIETY

"The object of Phi Sigma is to promote interest in biological research. Although originally designated as an honorary biological research society, it should be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

Mile Posts

1915	March 17, Alpha Chapter organized, Ohio State University, Columbus.
1916	May, Central Governing Body organized, BIOLOGIST first issued.
1917	June, last War-time BIOLOGIST issued.
1921	February, BIOLOGIST revived.
1924	December, First National Meeting, Constitution revised, Washington, D. C.
1925	December, Second National Meeting, First Science Program, Kansas City.
1926	December, Third National Meeting, Second Science Program, Philadelphia.
1927	December, Third Science Program, Nashville.
1928	December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.
1930	January, Council Meeting, Ritual Revised, Norman, Okla. December, Fifth National Meeting, Fifth Science Program, Cleveland.
1931	Phi Sigma Letters Registered, U. S. Patent Office.
1932	December, Sixth Science Program, Atlantic City.
1933	June, Sixth National Meeting, Seventh Science Program, Chicago.
1935	December, Seventh National Meeting, Eighth Science Program, St. Louis.
1937	December, Eighth National Meeting, Ninth Science Program, Indianapolis.
1939	December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.
1941	December, Tenth National Meeting, Dallas, Texas.
1946	December, Eleventh National Meeting, Boston, Mass.
1948	December, Twelfth Meeting, Albuquerque, N. Mex.

The Constitution provides that: "An active chapter may be established in any institution of learning which requires for graduation the equivalent of four years of collegiate work, and which is equipped with facilities for biological research work. . . . Any petitioning group must be active for at least one year before it may be granted a charter."